DEC 26 1928

**General Public Opinion Shapes Court Opinion and Influences the Enactment of Laws and Regulations; Hence, Pharmacy Should Be Directed so That General Public Opinion and That of Pharmacists May Be Alined.**

Vol. XVII, No. 12 DECEMBER, 1928

# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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Published Monthly by the American Pharmaceutical Association: Office of publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 10 West Chase Street, Baltimore, Md.

Annual Subscription, $4.00; Single Numbers, 35 Cents.

THE 77th ANNUAL MEETING WILL BE HELD AT RAPID CITY (BLACK HILLS), SOUTH DAKOTA, DURING WEEK OF AUGUST 26, 1929.

The 1929 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries will also be held at Rapid City, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3, 1917; authorized July 10, 1918.

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# The Season's Message

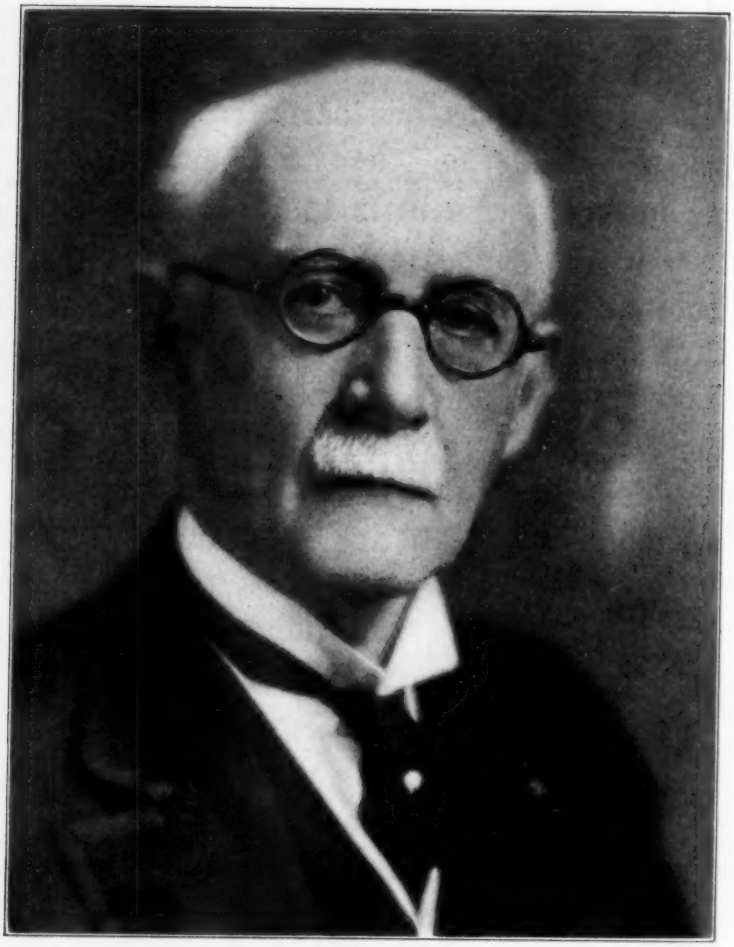
Christmas has been for centuries, and ever will be, the commemoration of the spirit of a little Child who came to earth a long time ago, and received homage and gifts from wise men of that day.

During this season of the year worries and perplexities of life should be forgotten and dropped off like an old coat of old years, and all of us stand forth, shining and glad, young in our strength and hopeful in the presence and promise of the New Year.

Let us therefore join- if we are wise- in the spirit of the children, setting aside the thought of material gain, sharing with them the simple joys, thankful for the gifts of the year just passing, and giving them the homage due to their young purity.

W. Dees
President

Watertown, S.D. Dec. 1928.



F. E. STEWART.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVII DECEMBER, 1928 No. 12

## FRANCIS EDWARD STEWART.

The nomination of Francis Edward Stewart for Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION was prompted by a recognition of what he has done for pharmacy. His outstanding services have been concerned with demonstrating the practicability of coöperation and coördination between the educational institutions related to the materia medica and materia medica supply business for the purpose of promoting progress in the science of pharmacology and the useful arts of pharmacy and pharmaco-therapy. These efforts were predominant factors in the organization of the Council on Pharmacy and Chemistry of the American Medical Association, the history of which has been contributed by the Honorary President, and is printed in this issue of the JOURNAL. Among other contributions to pharmacy Dr. Stewart's reports as Chairman of the committee on Patents and Trademarks A. PH. A. are records of value and have on several occasions served as references in preparing court decisions and as a basis for contracts.

Francis E. Stewart was born in Albion, N.Y., seventy-five years ago (September 13, 1853); his early education was received in Cortland County Academy and, later, at Oberlin College. When, in 1871, his father took charge of the construction work of the American Dredging Company, at League Island Navy Yard, Philadelphia, he matriculated in the medical school of the University of Pennsylvania. Later the young man decided to graduate in pharmacy before completing his medical course; this he did under the tutorship of H. C. Blair's Sons, Philadelphia, receiving his diploma from the Philadelphia College of Pharmacy, in 1876. His medical studies were continued at Jefferson Medical College, graduating with the class of 1879. During the period intervening between his first and second course in medicine he was employed in New York City as manager of Hunter's Pharmacy; then as chemist and director of H. T. Helmbold Buchu Manufacturing Company and at the same time, under the same financial auspices, he held for a brief period the presidency of F. F. Stewart & Co. These three years of varied experience gave him an insight into the retail drug business, "patent" medicine business, and manu-

facturing pharmacy. He also became a member of the Hospital Committee of N. Y. State Charities' Aid Association, and chairman of its Committee on Almshouses.

After graduation, Dr. Stewart opened an office for the practice of medicine in New York City and became staff physician of the N. Y. Loan Relief Association and clinical assistant to Dr. E. C. Seguin at the Manhattan Eye and Ear Hospital.

During his apprenticeship he made a study of condensed milk, and later invented rectal gelatin capsules; his results relative to the latter were reported in his graduation thesis at Jefferson Medical College and won for him the commendation of the faculty. Encouraged by the success, his studies were directed to nutritive enemata and brought desiccated defibrinated blood, in thin, soluble scales, to the attention of the medical profession. Wide publicity was given to the preparation and discussions *pro* and *con* led up to the proposal for a National Bureau of Materia Medica. Dr. Stewart's research and writing brought him into prominence and resulted in a connection with Parke, Davis & Co., as founder of its Scientific Department and associate editor of the *Therapeutic Gazette*. In the following year he returned to Philadelphia and was appointed assistant demonstrator of therapeutics in the University of Pennsylvania and was associated with Prof. Horatio C. Wood in his researches on hyoscine. Dr. Stewart resigned the editorship of the *Gazette* but added to his duties those of demonstrator of materia medica and pharmacy at Jefferson Medical College, and at Women's Medical College and quizmaster in pharmacy and theoretical chemistry at Philadelphia College of Pharmacy; he was also physician for the Southwestern Dispensary and Hospital, associate of Dr. John V. Shoemaker, associate editor of the *Medical Bulletin* and resident-physician of Philadelphia Hospital for Skin Diseases. For a time he was physician in the families of President Harrison and John Wanamaker, at Cape May Point, N. J., and house physician of Glen Springs Sanitarium, Watkins, N. Y. Pharmacy, however, always held an attraction, so we find him director of the scientific department of Frederick Stearns & Co., and in 1897, medical advisor of Merck & Co., chairman of the medical board and editor-in-chief of *Merck's Archives*.

The next reorganization work by Dr. Stewart was in California, being that of the business of Clinton E. Worden & Co., of Los Angeles and San Francisco, to which was jointed the Peairs Pharmaceutical Company. Then came the action which had a part in the formation of the Council on Pharmacy and Chemistry of A. M. A. In 1906, Dr. Stewart was invited by the British Medical Association to present his work to the Section on Therapeutics for consideration, which he did in a contribution entitled, "The Working Bulletin System for the Collective Investigation and Classification of the Newer Materia Medica," which gave a history of the Bureau plan, of its importance to medicine, pharmacy and the public at large.

Dr. Stewart's work has been productive. He has founded and organized scientific departments in connection with the commercial houses for research work, the publication of "working bulletins" and monographs and contribution to the materia medica collection at the Smithsonian Institution, and expeditions have been made to discover new drugs by organized expeditions. License to produce new discoveries combined with patent protection has been applied to the commercial introduction of insulin, antitoxins and serums. Our Honorary President has taken important part in these and other developments which have brought educational and industrial institutions into closer relations.

# EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

## DRUG STORE OWNERSHIP DENIED—WHAT NEXT?

IT HAS been evident for several years that those interested in pharmacy have not been satisfied with some of the changes that have been taking place, particularly with those that have tended to lessen the sense of personal responsibility which has become a tradition with these who deal in drugs and medicines. Many have become deeply concerned by these changes and some are convinced that on their account pharmacy has a very unpromising future before it.

Limiting the ownership of drug stores to those licensed by the state to conduct them seemed to many, who really studied the situation, the best means of overcoming the undesirable effects of the changes referred to above and which could, they believed, be attributed to what might be termed "absentee landlordship" in the sense that the stores were owned and in most instances directed by those who were not pharmacists. Ownership legislation has therefore occupied the attention of organized pharmacy for several years to a greater extent than any other corrective method and the experiences of New York and Pennsylvania seemed to offer real hope that relief might be at hand.

Other thoughtful pharmacists have never put much faith in the effectiveness of ownership legislation but have been willing to support it in the hope that if it did not accomplish all that its proponents claimed, it would at least do some good.

The recent decision of the Supreme Court has settled the question of ownership legislation for the time being, if not permanently. As loyal citizens, we must accept the decision, but as loyal pharmacists, we will take up the fight along other lines.

It appears that in the decision, pharmacy has lost and gained, and that, after all, the gain promises to be greater than the loss provided advantage is taken of it. Briefly expressed, the decision holds that the health and welfare of the people are protected by laws already in existence and the validity of which is not questioned and that ownership legislation is not, therefore, a valid exercise of the police power of the state which brings it into conflict with the fourteenth amendment to the constitution, and this may be set down as a loss to pharmacy; at the same time, the decision recognizes, by inference, the importance of pharmacy and, directly, the necessity for regulating the practice of it, which is a distinct gain.

The decision sets out that the health and welfare of the public with respect to pharmacy are protected by laws which are specially referred to therein and which regulate the prescription, compounding of prescriptions and the purchase and sale of medicines by providing, as is briefly stated, that

1st.—None but a licensed physician may practice medicine or prescribe remedies for sickness.

Second.—No one but a licensed pharmacist lawfully may have charge of a drug store.

Third.—Every drug store must itself be registered and this can only be done where the management is in charge of a registered pharmacist.

Fourth.—Stringent provision is made to prevent the possession or sale of any impure drug or any below the standard strength, quality and purity as determined by the recognized pharmacopœia of the United States.

5th.—None but a registered pharmacist is permitted to compound physician's prescriptions.

Sixth.—And, finally, the supervision of the foregoing matters and the enforcement of the

laws in respect thereof are in the hands of the State Board of Pharmacy, which is given broad powers for these purposes.

The decision, of course, referred to laws already in existence in Pennsylvania, but laws of similar purport are in force in practically every state.

The decision then states:

"It, therefore, will be seen that without violating laws, the validity of which is conceded, the owner of a drug store, whether a registered pharmacist or not, cannot purchase or dispense impure or inferior medicines; he cannot, unless he be a licensed physician, prescribe for the sick; he cannot, unless he be a registered pharmacist, have charge of a drug store or compound a prescription. Thus, it would seem, every point at which the public health is likely to be injuriously affected by the act of the owner in buying, compounding or selling drugs and medicines is amply safeguarded."

Now if these laws mean what they say, as evidently the Supreme Court had accepted them to mean, and if they are enforced, as the Supreme Court evidently expected them to be in protection of the public health, would not the condition sought under ownership legislation be very closely approached? In other words, should pharmacy's attention not be turned toward an effective enforcement of the laws now in force, the validity of which is conceded, and which, it is reasonable to assume, will receive not only public but also judicial support since they are for the protection of the health and welfare of the people?

The laws referred to are evidently intended to require that any establishment which holds itself out to the public as a pharmacy or drug store shall be prepared to furnish the services expected of it and under the safeguards which protect the public, and that pharmacy shall be practiced only by those charged with that responsible duty by the state. It is equally evident that these laws are intended to require that an establishment, which is not prepared to meet these provisions, shall not use titles that mislead the public.

The effectiveness of these laws must depend to a very considerable extent on what the Supreme Court means by the words "have charge of a drug store" and the words of the same meaning as found in the pharmacy laws of the several states. If "no one but a registered pharmacist lawfully may have charge of a drug store" really means what the words indicate, then evidently many drug stores are not conducted in compliance with laws, the validity of which is conceded as the Supreme Court says, even though a registered pharmacist may be employed therein, for the pharmacist is not in responsible charge when the management of the store and its direction is under the control of some one else. It does not seem reasonable to suppose that large interests would invest in enterprises which were required by law to be in charge of a registered pharmacist if *in charge* really means *responsible management.*

---

## TO-DAY AND TO-MORROW.

AN OUTSTANDING event for Pharmacy in the year drawing to a close is the purchase of a most desirable site for the Headquarters Building, the satisfaction of which is enhanced because a large part of the purchase money was provided by liberal donors. Their disinterestedness adds a value to the gifts which bespeaks assurance to others which, it is hoped, will induce the founding of endowments that will insure the greatest possible service to pharmacy and the drug-trade industries.

The Laboratory of the Headquarters is provided for and, it is reasonable to assume, with a recognition of its possibilities further developments will follow. Further contributions have been made to the Museum during the year—it is hoped that, eventually, the collections will exhibit the history of Materia Medica and show the steps of the processes involved in pharmaceutical manufacturing and also in the production of articles of merchandise, utensils and apparatus. The Library has been added to by a number of donors; these gifts should be suggestive to others and also that endowments of the Library offer opportunities for memorials. The reports made at the Portland meeting of the progress of the Headquarters Fund are encouraging.

While the Headquarters is constantly in mind and therefore is the first item of this comment other events of moment have transpired. Perhaps the decision of the U. S. Supreme Court on the Pennsylvania Ownership Law should next be mentioned; it is the subject of an editorial in this issue and reference to the decision is also made in other sections of this number.

The SYLLABUS received editorial comment in the November JOURNAL. Likewise, the creation of a Pharmaceutical Corps in the Army. The Capper-Kelly Bill will come before Congress as a Committee report at this session. In the latter connection the slogan of the November JOURNAL is repeated here:

> The success of all worthy endeavor requires that those who further it present a united front and have the backing and strong support of those they represent.

Among other projects under way and being seriously considered is a survey of pharmaceutical education and of institutions teaching pharmacy in which the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION join. The first edition of the A. PH. A. RECIPE BOOK will make its appearance about the first of the year; also another volume of the YEAR BOOK, and the General Index of the PROCEEDINGS and YEAR BOOKS beginning with 1903 will soon follow. All of this speaks for progressive activities.

The transactions and resolutions of the Portland meeting have been published in recent issues of the JOURNAL; a perusal of them will recall the busy sessions to those who attended, and give others an idea of the work accomplished and of equally important ASSOCIATION projects being activated.

Nearing the close of the year and at the threshold of another the following thoughts suggest themselves. The public is on familiar terms with pharmacists, perhaps not as much so as formerly, but its confidence frequently comes into evidence and this for the good of pharmacy should be maintained. The commercial and economic structure rests on confidence—when business men disregard agreements—whenever they find it to their interest to do so, they destroy mutual respect. Conditions have made it necessary for most pharmacists to earn their living by merchandising in addition to rendering professional services, in other words—pharmacists are concerned with both business and profession—the drug business rests on pharmacy; recent court decisions have taken cognizance of that. Liberty is taken in quoting from an address by Judge Chester A. Batchelor:

> "By all honorable means preserve the traditions, integrity and usefulness of your profession. To so preserve them you must safeguard the privileges gained through your scientific study, work and experience."

# SCIENTIFIC SECTION

## A CONTRIBUTION TO THE CHEMISTRY, PHARMACOLOGY AND THERAPEUTICS OF AGAVE SALMIANA.*

BY G. G. COLIN.[1]

### INTRODUCTION.

About 25 years ago, by the initiative of a few leading physicians, the government established a scientific institution which was named "Instituto Médico Nacional." The object of this institution was to study the large number of native drugs and determine their therapeutic value, to classify the unknown specimens botanically, and to isolate their active principles and study them chemically. Most of the results of the work carried out by this institution are recorded in an interesting publication called "Anales del Instituto Médico Nacional" (1), of which only one edition was printed.

The following historical data were taken from this publication with the aid of Dr. E. Novoa, who offered his assistance at the library of the "Direccion de Estudios Biológicos de la Secretaria de Agricultura y Fomento," which has taken the place of the extinct Instituto Médico Nacional.

### HISTORICAL.

"People in rural communities have found this plant (*Agave Salmiana* or Maguey) to be a panacea. It is claimed that there is no disease that will not yield immediately to treatment with the various applications of the products of this plant. The juice of its leaves is used for rubbing purposes in various conditions. The ancient Indians knew of the medicinal properties of this plant and used it in the treatment of different diseases. Country people to this date continue to use it in a similar manner in prescriptions or home remedies such as the following:

"To cure blows and contusions in the chest, use a beverage composed of about two liters of juice from the leaf of the plant, sugar and raisins. The juice is first evaporated on the open fire and then the other ingredients are added. The patient is instructed to keep a moderate diet."

For internal tumors the following formula was recommended:

"About 1 liter of the juice from roasted leaves together with some raisins, licorice, otate and cuautecomate wood, and four maguey thorns are disintegrated and mixed together. The mixture is concentrated on the open fire. The resulting concoction is given to the patient in small cup doses, one every twelve hours. The roasted leaf is also applied externally over the lesion to help healing."

"For gonorrhea it is recommended to drink every day for about two weeks, half a liter of aguamiel (Savia Agaves) boiled previously."

"The gum or resin formed at the lower part of the stem or leaf is said to be a good toothache remedy, placing a small piece of the material over the affected tooth and keeping it there for some time."

The efficacy of such remedies is a matter of wide popular speculation. There are other applications so absurd that they are not mentioned here.

"In the year of 1790, a curandero (a practical healer using herbs to cure disease, also called hierbero) from Pátzcuaro arrived in the city of Mexico. His name was Nicolas de Viana and his

* Scientific Section A. PH. A., Portland meeting, 1928.

[1] Central Chemical Laboratory, Dept. of Pharmacology, Mexico, D. F.

nickname "El Beato" (The Bigot). He addressed the Tribunal of the Protomedicate, stating that he possessed the secret of an infallible cure for venereal diseases, which secret he had obtained from an Indian woman who had used it from time immemorial."

"The Royal Tribunal of the Protomedicate, knowing already of Viana's achievements, suggested that new experiments be carried out under the direction of an able physician. The well-known Dr. Jove was appointed to carry out the work. Viana was allowed to experiment at the hospitals, where it is said he cured completely over 100 patients with venereal disease. The cures were effected in 30 days.

"Doctors Jove, Guiral and Rada became so impressed with the results observed that they declared Viana's remedy to be a blessing to humanity. Further clinical experimentation was carried out by these physicians when Dr. Nuñes, Archbishop of Mexico, became interested in this work and commissioned Dr. Jove to perfect Viana's method and apply it at the other hospitals in a more scientific manner."

"While these experiments were carried out Dr. Balmis arrived at Vera Cruz and heard about them. After having been appointed Chief Surgeon he was requested to investigate this new method of curing venereal disease."

"Viana used three formulas in his method. One of them was a decoction with sudorific properties made of Savia agaves, agave roots, snake meat and castilian rose. Another formula was an infusion of several roots (Sasafrás, Sauco, Zarza), lemon and copal gums. These two were alternated with vegetable laxatives and enemas."

"Dr. Balmis introduced some rational modifications in these formulas and in their method of administration, and is said to have obtained very satisfactory results. Among the patients treated were found men, women, children of both sexes; old men, pregnant women, all classified as incurable even if using massive doses of mercury. The total number of cases successfully treated was about 350, out of which Dr. Jove treated more than 24 personally."

"Later on, Archbishop Haro became thoroughly convinced of the efficacy of this method (by that time Begonia had also been added to the various mixtures used) and wished that Spain should also be benefited by Viana's discovery. Dr. Balmis was appointed to carry this agave therapy to Spain, and he sailed in 1792 with a large supply of agave material and begonia."

"In July 1792 Dr. Balmis began to use his new therapy at the Hospital of Madrid. At the Hospital of San Juan de Dios 12 patients with gonorrhea were chosen. Four were completely cured, others improved and two of the patients, in which the disease was too far advanced, died."

"At the Hospital de la Pasión seventeen new patients were observed, all women; some were cured, others improved and none died."

"At the Hospital General another twenty-five observations were carried. Of these cases twenty were cured."

This literature goes on giving detailed case reports to illustrate the action of the agent used by oral administration.

### CHEMISTRY OF AGAVE SALMIANA.

There are several classes of agave of which *Agave Salmiana* or *Agave Americana* is the one dealt with in this paper. The common name in Spanish is "Maguey manso" ("Metl" in the Mexican language) (2). According to Segura, it was called "Teometl," "Tlacametl," "Centemetl." It grows in the valley of Mexico. The kind most sought is that grown in the prairies of Apam.

Lenoble found in the leaves of *Agave Americana* an acrid volatile oil, a gum-resin, chlorophyl, cellulose, acid calcium malate and other salts.

Prof. Palacios (3) in 1895 made a qualitative analysis of the juice of the plant and found a density of 1.022–1.024 in the liquid. It has an acid reaction and gives a copious flocculent precipitate upon addition of alcohol in excess. NaOH, $Ca(OH)_2$, $H_2SO_4$, ammonium oxalate and barium nitrate all produce precipitates when added to this juice.

The juice obtained by expression was found to be very unstable, undergoing an acid fermentation unless sterilized or preserved with chloroform. The qualitative examination of the solution revealed the presence of saponins, reducing sugars, a soluble calcium salt, phosphorus, a small amount of protein and other common constituents of ordinary vegetable extractives.

Since the object of this investigation was mainly to find out whether products of this plant actually had any therapeutic value, our efforts were directed towards preparing a solution suitable for hypodermic administration. The first tests showed that the crude liquid was highly toxic to animals. The saponins in the solution were found to be hemolytic, and there was also a highly irritant substance contained in the stems; after several trials, by fractional precipitations using a large excess of alcohol which was later distilled off, the solution was concentrated to its original volume and thus freed from toxic and inert constituents. From this solution practically free from impurities two crystalline substances could be isolated. One was obtained by partial evaporation of the liquid in an acid medium, while the other was obtained by first neutralizing the solution and then adding an excess of alcohol. The first precipitate (from acid solution) is a light brown powder, partially soluble in water and forming a colloidal solution. The precipitate from the alkaline solution has a lavender color while moist, and dark gray in the dried form, being practically insoluble in water and the ordinary solvents. The acid precipitate contains about 15% calcium; the ash contains about 62% calcium. The ash from this same substance amounts to 24%. The phosphorus content of the acid powder is about 0.50% (cal. as $P_2O_5$) and that of the lavender colored powder (alkaline) about 2%.

Solubility and hydrolysis tests showed that the substance was not a nucleoprotein. However, tests for mineral phosphorus were negative with magnesia mixture and uranium acetate. Ferric chloride gives no precipitate in the cold, but on warming, precipitation is observed.

The liquid much used by the natives as a drink called "Pulque" is a product of the agave plant. It is a white opalescent viscid liquid with a sour-sweet taste with a density of 1.025–1.046. This liquid, before it is manipulated or "doctored" to become pulque, in its fresh native state is called officially "Savis Agaves" in the new Mexican pharmacopœia. Rio de la Loza, Boussignault (2) and other authors have analyzed it with the following results:
According to Rio de la Loza its composition is:

| | | | |
|---|---|---|---|
| Sugar | 9.55% | K, Na, Ca, Mg, Cl, $SO_4$, $PO_4$, $SiO_2$... | 0.726% |
| Gum and sol. albumen | 0.540% | Water, resins, albuminoids and undetermined | 9.180% |

According to Boussignault its composition is:

| | | | |
|---|---|---|---|
| Levulose | 2.645% | Albumen | 1.013% |
| Sucrose | 6.171% | Ammonia | 0.006% |
| Malic acid | 0.353% | Mineral substances | 0.621% |
| Gums | 0.545% | Water | 8.650% |

"Savia Agaves" is alleged to have anti-scorbutic and anti-gonorrheic properties. There is a proprietary preparation on the market called "Agmel" based on this substance, and its manufacturers claim that it has therapeutic properties.

PHARMACOLOGY.

A solution containing about 1.5% soluble calcium salt and 0.01% phosphorus (as $P_2O_5$) was prepared from the isolated principle and used hypodermically on rabbits in the first experiments. It was found that no appreciable effect was obtained even in doses of 2 cc. per Kg. wt.

The animals were kept under close observation during a week. In view of this apparent lack of toxicity it was decided to prepare a more concentrated solution, and one having the following approximate composition was prepared:

| | |
|---|---|
| Soluble calcium (calc. as CaO) | 0.689% |
| Phosphorus (calc. as $P_2O_5$) | 0.067% |
| Acidity (in cc. $N/10$ NaOH per 100) | 90.00 % |

Dissolved in normal saline solution.

The amount of CaO in terms of calcium lactate would be about 4% against 1.5% of the solutions first used in the tests. The solution was equally well tolerated by the animals. There were no appreciable changes in the blood counts nor any other undesirable effects.

The author and several members of his staff were given 1- and 2-cc. injections of the concentrated solution without experiencing any toxic effects. The only disadvantage was that this stronger solution proved to be too painful and this was corrected by the addition of 1% stovaine. Although it was found that the painfulness was due to the acidity of the solution, the excess acidity could not be neutralized without causing the substance to precipitate. If applied hypodermically in a precipitated condition indurations were formed and the absorption was very slow.

THERAPEUTICS.

It is impossible to state here the many uses which the maguey plant has been given as a medicinal agent. The solution described above was originally prepared in order to investigate the utilization of a soluble calcium salt, in its native condition. For the purpose Dr. Carl Nielsen's collaboration was requested but, unfortunately, other work prevented him from taking up the investigation. We wish to express our thanks to Dr. Albert Schneider for having carried out some tests with the original 1.5% solution.

The difficulty in securing white mice of known breed for nutrition experiments was an obstacle for the study of calcium fixation or retention using this agave solution. The work was temporarily postponed, and at that time, suggestions were offered to investigate the alleged anti-syphilitic properties of agave.

Dr. Miguel Cordero (4), Chief of the Division of Pharmacy and Chemistry of the Health Department, had at one time carried out some experiments in collaboration with Dr. Fernando Zárraga at the Hospital Morelos. These investigators had observed in a few cases the healing of secondary syphilitic ulcers with the oral administration of an Agave extractive. I found out accidentally that at a certain second-hand book shop there was an old treatise dealing with the curative properties of Agave extractives. The title of the book, edited in 1767 is, freely translated:

"Demonstration of the efficacy and virtues, newly discovered, of the roots of two plants from New Spain, species Agave and Begonia for the treatment of ve-

nereal and scrofulous vices and other diseases that resist treatment with mercury and other known remedies. By Dr. Francisco Xavier Balmis, Surgeon Counselor to the Royal Armies, member of the Royal Academy of Medicine of Madrid, appointed by H. M. to verify the investigation carried out at Madrid concerning the curative properties of these plants."

This book is dedicated to the Duke de la Alcudia who apparently financed the investigation, and its object was to prove, against the skepticism of another physician, Dr. Piñera, that the Agave and Begonia treatment was a boon to humanity. Upon carefully examining this literature one can see that the basis of such treatment was to determine copious perspiration and to apply rather vigorous catharsis which, judged from modern therapy, strikes one as a rather veterinary-like procedure.

When it was decided to investigate the properties of the isolated principle, it was planned to ignore the use of sudorifics and cathartics in order to determine the action of the hypodermic solution alone. Dr. Demetrio Lopez, to whom I resorted, among the other physicians, for suggestions, was of the opinion that any beneficial effects as observed by Dr. Balmis had been probably caused by the sudorific action and by catharsis for, in the the absence of arsenic, bismuth or mercury, hardly any specific action could be expected from such a treatment.

The collaboration of several specialists on veneral diseases was secured and Dr. G. González Aréchaga (5), of the Health Department initiated the investigation, ably seconded by the students E. Novoa, who later carried out the animal experimentation with the glucosides of *Castela Nicholsoni*, and E. Sanchez Torres.

Ten cases of secondary syphilis were selected and the case reports have been published elsewhere ("Cronica Medica Mexicana," XXVII, No. 4, 158–168 (April 1928)). Seven patients improved and their ulcers healed completely leaving only a slight pigmentation, two showed little improvement, and one did not improve at all. Later on, Dr. Fernando Lopez selected ten other patients and the results were negative in all the cases treated. About 30 cases in all were investigated by different observers of which about one-half responded to treatment favorably and the other half failed to respond at all. The following conclusions could be derived from the clinical study:

*1.*—Among the 30 cases observed, primary, secondary and tertiary syphilitic subjects were treated.

*2.*—Cases with secondary ulcers responded best to the treatment.

3.—In tertiary syphilis astounding successes and failures were observed.

*4.*—Cases resistant to clinical improvement with specific agents responded surprisingly well to Agave substance, other similar cases did not improve at all.

*5.*—The effect on the Wassermann reaction was somewhat uncertain, and in some cases no relation could be established between clinical improvement and the modified Wassermann R.

*6.*—The following conditions were observed:

(*a*) Marked clinical improvement and modification of W. R.
(*b*) Marked clinical improvement and slight modification of W. R.
(*c*) No clinical improvement and marked modification of W. R.
(*d*) No clinical improvement and slight modification of W. R.
(*e*) No clinical improvement and no modification of W. R.

Under (*a*) may be added: Marked clinical improvement and no modification of W. R.

*7.*—It was rather disappointing to observe that two patients with apparently the same type of lesions would respond differently to the same treatment: one would respond as though under specific treatment while the other showed absolutely no signs of improvement.

*8.*—The fact that Agave substance is capable of influencing, without any appreciable reaction, the involution of syphilitic ulcers in some cases and even determine an unmistakable clinical improvement in tertiary cases, suggests further study.

*9.*—The fact that in certain cases a modification of the W. R. is observed also warrants further investigation.

*10.*—Agave substance is applicable in cases of intolerance to specific treatment with about 40% or 50% probabilities of clinical improvement although no assurance of specific action may be had.

*11.*—One case in which an overdose of Agave substance was given by mistake (about 12 cc. of concentrated solution equivalent to 36 cc. of the original one and one-half per cent) slept during 24 hours. Somnolence induced by the administration of therapeutic doses of Agave substance was frequently observed. The larger doses of Agave substance are apt to cause slight fever but not true alergic reactions were observed. The substance may be considered practically non-toxic even for small children, in large doses.

Dr. Fernando Lopez did not present a written report of his 10 cases where no favorable results were observed. In his work, the maximum amount of Agave solution given was only 5 cc. of the dilute solution whereas, later, doses as large as 10 cc. of concentrated solution (equivalent to 30 cc. of the dilute solution) were given daily by other collaborators. However, good results were not necessarily obtained with the larger doses. Just why some patients respond to this treatment and others do not is not known.

At the time of writing this report there are some collaborators who are still investigating the problem and report consistently good results in hereditary syphilis.

## DISCUSSION.

Whatever conclusions may be derived from the above data, they should be taken only from the clinical point of view, for there is no conclusive evidence of specific action. The solution used does not contain arsenic, bismuth or mercury, or any other metal of recognized anti-luetic properties. The precipitated substance contains as an impurity an undetermined amount of sapogenin (saponins are abundant in the Agave juice or exudate) although this impurity loses its hemolytic properties in the process of preparation and purification.

Calcium salts, soluble or insoluble, have never been found to possess any trypanocidal action so that there is no ground to suppose that this form of calcium is responsible for the effects observed.

If we consult the pharmacology of saponins (sapo-toxins and sapo-glucosides) (7) and (11) we see that these substances tend to alter protoplasmic surface tension and have a special affinity for cholesterol. The sapogenin contained in the solution used, in contrast with other similars, was observed to have the following properties:

(*a*)—It has no hemolytic properties *in vivo*. Many patients have taken considerable amounts of this solution by hypodermic administration over periods of from one to forty-eight weeks without any signs of hemolytic action. No hemolysis occurs *in vitro*.

(*b*)—It does not cause irritation to mucous membranes.

(*c*)—It does not possess the peculiar acrid taste and does not have sialagogue action. No symptoms of nausea, vomiting or diarrhea have been observed with its use.

(*d*)—Its hypodermic administration causes only a slight local reaction.

(*e*)—Systemic action: No appreciable effect on the nervous system has been observed unless the somnolence reported in some cases is due to it. The administration of even small quantities of other saponins to the animal may prove fatal, causing convulsions and paralysis of the respiratory center. No such effects have been observed by the substance under discussion. However, the original saponin occurring in the plant juice does possess the toxic properties of ordinary saponins.

Has the alteration of plasma surface tension any relation to the therapeutic effects observed? No experiments have been carried out along that line to determine if this sapogenin may cause effects on surface tension similar to those observed by sodium ricinoleate. It has been shown (6) that the cultivation of *Tubercle Bacilli* in a medium containing small amount of saponin does not inhibit their growth but it does affect appreciably their acid-resistant properties and morphology. It has also been shown that non-specific agents (8, 9, 10) like tuberculin may modify favorably the involution of a syphilitic ulcer but such an effect is usually brought about at the expense of some focal reaction of some intensity and in the case of Agave substance the patient improves unaware of any general or focal reaction. This, however, would be no proof that there is no physico-chemical or biological change at the site of the lesion if such be the mechanism of action of the substance under investigation.

## CONCLUSIONS.

*1.*—A crystalline substance from the juice of *Agave Salmiana* has been isolated and used parenterally in the human being to investigate its alleged antisyphilitic properties.

*2.*—In agreement with the data in ancient and recent literature on the subject some therapeutic properties have been observed without the use of cathartics or sudorifics.

*3.*—The results observed do not prove conclusively that such a substance may be depended upon as a specific treatment. Although some of the cases treated have been observed to improve clinically, eliminating as far as possible all chances of spontaneous involution of the lesions, others have failed to show any improvement under exactly the same treatment.

*4.*—The effect on the Wassermann reaction is not consistent and may be considered doubtful.

*5.*—Experimentation over a large number of cases under perfectly controlled conditions would be the only way to arrive at definite conclusions.

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## NOTES UPON INDIAN EPHEDRAS.

BY B. E. READ AND C. T. FENG.

With the occurrence of several species of Ephedra in Western Tibet and Northern India it was thought that here lay a further possible supply of crude material for the production of ephedrine. However, seeing that not all species of ephedra contain ephedrine, and that in others the chief alkaloid present is the isomer pseudoephedrine it was thought to be of importance to make a chemical analysis of the Indian Ephedras. Books (1), (2) upon Indian materia medica list two ephedras, *E. vulgaris* and *E. pachyclada*, under the Persian name "Huma," and other names which are not familiar. It is considered to be the Soma of the Vedas. A personal visit to the Forestry Department at Dehra Dun revealed the fact that in Northern India there are three common species of ephedra and several varieties of the same. *Ephedra intermedia*, *E. Gerardiana*, and *E. foliata*, the last mentioned growing on the plains.

### ANALYSES.

With the samples kindly supplied we have undertaken in our Peking laboratories identical examinations for the alkaloids to those done upon Chinese Ephredas and published from time to time. The sample of *Ephedra intermedia* was sufficiently large to allow of our doing numerous analyses upon the various parts of the stem, the dry brittle stems loose in the package giving slightly higher values. The methods used were as recently published (3), number 3 by direct alkalinization being found most suitable for regular assay work. This was checked with further analyses by modified methods. The percentage of alkaloid present was calculated from the acid titration values, the titrated solutions being subsequently tested by the "Biuret Test" (4) for the relative percentages of ephedrine and pseudoephedrine. The identity of these two isomers in the case of *Ephedra intermedia* was conclusively confirmed by the preparing of their hydrochloride salts with their characteristic melting points and optical rotation. Having but small samples of *Ephedra Gerardiana* the identity of the alkaloids depended on the Biuret reaction, which is quite reliable and final for practical purposes. The results are shown in Table I.

TABLE I. ASSAY OF INDIAN EPHEDRAS.

| Species of Ephedra. | Total alkaloid $C_{10}H_{15}ON$. | Biuret test. Ephedrine. | Biuret test. Pseudo-ephedrine. | Percentage in plant. Ephedrine. | Percentage in plant. Pseudoephedrine. |
|---|---|---|---|---|---|
| 1. *Ephedra Intermedia* | | | | | |
| (*a*) Dry broken stems | 1.17% | 30 to 40% | 60 to 70% | 0.351 to 0.468 | 0.702 to 0.819% |
| (*b*) Unbroken stems | 1.14% | 30 to 40% | 60 to 70% | 0.342 to 0.456 | 0.684 to 0.798% |
| Average | 1.155% | 30 to 40% | 60 to 70% | 0.347 to 0.462 | 0.693 to 0.809% |
| 2. *Ephedra Gerardiana* | 1.65 to 1.70% | 70 to 80% | 20 to 30% | 1.17 to 1.34 | 0.335 to 0.505% |
| *Ephedra sinica* | 1.315% | 80 to 85% | 15 to 20% | 1.052 to 1.118 | 0.197 to 0.263% |
| *Ephedra equisetina* | 1.754% | 85 to 90% | 10 to 15% | 1.49 to 1.579 | 0.175 to 0.264% |

*Isomers and Other Assays.*—The results of these assays for *Ephedra Gerardiana* are about as high as the best figures obtained from *Ephedra equisetina* (5), but the relative amount of ephedrine is not quite as good. The latter yielded 85 to 90% of the total alkaloid as ephedrine, making the ephedrine content of mature *E. equisetina* 1.49 to 1.58% as compared with 1.17 to 1.34% for *E. Gerardiana*. The very large amount of pseudoephedrine in *E. intermedia* does not disqualify it as a possible source of ephedrine, because the conversion of the one isomer to the other is, up to 50%, quite a simple operation. In spite of the reported discovery of other isomers in Chinese Ephedras the amounts present are so small as to be insignificant, such might be obtainable from the mother liquors of Indian ephedras extracted in large bulk, but it is not to be expected that they are present in any large amounts.

*Differences in Species.*—The various species of Ephedra show gross morphological differences chiefly concerning the woody or herbaceous character of the stems (5), the length and weight of the nodes, the number of nodes or joints, etc. The sample of *Ephedra intermedia* was critically examined upon these points. Table II shows the average length, weight and number of internodes in this species. The longest stem measured 26 cm., the average length was 7.74 cm. This does not refer to the main stems which were woody and known to contain practically no alkaloid. In *Ephedra sinica* it has been shown that the nodes or joints of the stems contain a greater amount of pseudoephedrine than the internodes (6), hence the number of joints or in other words the length of the internodes in each species may have a bearing on the proportions of the isomers present.

The sample of *E. intermedia* contained many broken dry pieces which averaged only 25 mg. for the weight of each internode, and 24 mm. in length, this would be due to dryness, also to the fact that these pieces were terminal parts of growing stems. Nearly two thousand short pieces of about one nodal length were examined, and none showed the weight or length of the more complete samples.

*Seasonal Variation.*—These analyses need a further note with regard to seasonal variation. Chinese ephedras, in autumn contain three times as much ephedrine as in spring (7). It is not impossible that there are to be obtained more favorable samples than those examined. Indian artemesias show greater seasonal variation in santonin content, and ephedra may also show big differences.

*Therapeutic Significance.*—The very great difference in the alkaloids occurring in *E. intermedia and E. Gerardiana* show plainly that they are not likely to yield identical physiological effects. The former containing so much pseudoephedrine is not likely to produce such favorable results on the respiratory passages, or tissue shrinkage. It seems quite incorrect to classify several species together as one drug, as has been done by Nadkarni. Pseudoephedrine has been shown to

TABLE 2. ASSAY OF A SAMPLE OF MAHUANG FROM DEHRA DUN, EPHEDRA INTERMEDIA

| Length of stems. Cm. | No. of stems. | Total length. Cm. | No. of internodes. | Average length of internodes. Mm. | Total weight. Gm. | Average weight of internodes. Mg. |
|---|---|---|---|---|---|---|
| 2 | 21 | 42 | 24 | 18 | 0.59 | 24.6 |
| 3 | 43 | 129 | 60 | 22 | 1.49 | 24.8 |
| 4 | 40 | 160 | 70 | 23 | 1.88 | 26.9 |
| 5 | 50 | 250 | 93 | 27 | 3.25 | 35.0 |
| 6 | 72 | 432 | 160 | 27 | 5.59 | 35.0 |
| 7 | 48 | 336 | 120 | 28 | 4.52 | 37.7 |
| 8 | 24 | 192 | 64 | 30 | 2.72 | 42.5 |
| 9 | 23 | 207 | 69 | 30 | 3.04 | 44.0 |
| 10 | 22 | 220 | 71 | 31 | 3.21 | 45.2 |
| 11 | 15 | 165 | 54 | 31 | 2.52 | 46.7 |
| 12 | 17 | 204 | 63 | 32 | 3.04 | 48.2 |
| 13 | 13 | 169 | 53 | 32 | 2.59 | 48.9 |
| 14 | 13 | 182 | 56 | 33 | 2.74 | 48.9 |
| 15 | 5 | 75 | 23 | 33 | 1.20 | 52.2 |
| 16 | 9 | 144 | 43 | 33 | 2.30 | 53.5 |
| 17 | 6 | 102 | 27 | 38 | 1.51 | 55.9 |
| 18 | 5 | 90 | 24 | 38 | 1.39 | 57.0 |
| 19 | 3 | 57 | 15 | 38 | 0.91 | 60.6 |
| 20 | 5 | 100 | 28 | 36 | 1.83 | 65.4 |
| 21 | 3 | 63 | 18 | 35 | 1.21 | 67.2 |
| 22 | 1 | 22 | 6 | 37 | 0.42 | 70.0 |
| 23 | 1 | 23 | 7 | 33 | 0.60 | 85.7 |
| 24 | 1 | 24 | 7 | 34 | 0.65 | 92.9 |
| 25 | 0 | 0 | 0 | | | |
| 26 | 1 | 26 | 8 | 32 | 0.80 | 100.0 |
| | 441 | 3414 | 1163 | 30 | 50.00 | 43.0 |
| *Ephedra sinica* | | | | 35.4 | .. | 21.3 |
| *Ephedra equisetina* | | | | 19.2 | .. | 13.1 |

have under certain circumstances an opposite effect to ephedrine upon vasoconstriction, and its blood pressor action is more musculotropic than neurotropic and the reverse is true for ephedrine.

*Comparison with Other Assays.*—Chopra (8) and his co-workers in Calcutta have recently reported upon these Indian Ephedras and state that *Ephedra Gerardiana* Wall (syn. *E. vulgaris*, Rich. and *E. distachya*, linn.) contains in the green twigs 1.49% total alkaloids in which they reckon 1.06% is pure ephedrine. This result is similar to our own obtained from a slightly better sample.

Further they analyzed *Ephedra intermedia*, Schrenk and Mey (synonym *E. pachyclada*, Boiss.), and found 1.8% total alkaloids in the green twigs and 1.16% in the mixed stems and twigs, in which they report 1.058% and 0.682%, respectively, of ephedrine. This is greatly divergent from our most favorable result which gave 0.351% of ephedrine in a total alkaloidal content of 1.17%. After assaying our material we purified and recrystallized our alkaloids obtaining from each hundred grams of crude drug 0.18 Gm. of pure ephedrine hydrochloride melting at 215–216° C. and 0.39 Gm. of pure pseudoephedrine alkaloid melting at 118° C., which closely approximate the ratio of these two alkaloids 30% to 70% as observed by our Biuret assay method. Examination of our mother liquors from the various crystallizations showed the presence of the residual amounts of alkaloids.

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# AN UNUSUAL FACTOR INFLUENCING ACTION OF SOME DRUGS ON SMOOTH MUSCLE.

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## INTRODUCTORY.

The study of the action of a drug from a broad pharmacological point of view is vastly more complicated than is generally appreciated by the clinical practitioner and even by specialists in other fundamental medical sciences. One of the most important phases connected with a complete pharmacological study of the drug is the necessity for the investigation of various *conditions* affecting the action of such a compound. The conditions influencing the action of drugs are of a three-fold nature. They may depend upon the drug itself, as for instance the dose of the reagent administered, its concentration, its method of administration, etc. Again they may depend upon the patient or animal to which the drug is administered. Thus for instance, the age of the animal may play an important rôle apart from the dosage; the condition of the subject whether normal or pathological may make a great difference in its reaction to the drug, etc. Not only may the action of a drug vary with individual subjects but even various organs and indeed parts of the same organ may respond differently to one and the same pharmacological agent. Thus Young and Macht have shown that the smooth muscle tissue of the *trigonum vesicae* responds very differently to certain sympathetic and para-sympathetic drugs from the smooth muscle of the fundus of the same bladder (1). Again the difference in response between pathologic and normal tissues has been well illustrated by the researches of Macht and Ting who found that the bronchi of pigs respond differently to Epinephrine, Pilocarpine, Atropine and the other pharmacological reagents when the animals suffer from bronchial pneumonia as compared with the response of the bronchial muscle from normal pigs' lungs (2). Finally, in the third place, the action of drugs may be profoundly influenced by certain external conditions. For instance, the room temperature may markedly affect the action of a drug as is the case with injections of Colchicine in frogs; ultraviolet rays increase the potency of Quinin and Quinidin Sulphate injections in rats as shown by Macht and Teagarden (3), and polarized light was found by the present author to affect the convulsions produced by camphor to a greater degree than non-polarized light of the visible spectrum of exactly the same intensity (4). All these various factors concerned in drug action have been discussed by the author elsewhere (5). The present note is intended

to give another remarkable illustration in regard to the effect of certain conditions on the action of drugs.

### STUDIES ON THE VAS DEFERENS.

The author and his assistants in this laboratory have been accustomed, among other routine procedures in connection with the examination of drugs, to test the activity of Corpus Luteum preparations on the contractility of the isolated *vas deferens* of rats. This reaction was first described by Matsumoto and Macht in their studies concerning the response of various genito-urinary organs to treatment with all kinds of endocrine and other glandular products (6). These authors noted that the *vas deferens* of rodents and more particularly of the guinea-pig and rat was extremely sensitive to the treatment with extracts of the Corpus Luteum of various animals. Even a very small quantity of Corpus Luteum extract introduced into a chamber containing an isolated vas caused a marked contraction of the organ and such a contraction was not produced by equivalent quantities of other gland extracts, with the exception of Epinephrine.

The method of study has been described elsewhere and consists of suspending a healthy *vas deferens* freshly dissected from a rat, in oxygenated Locke's solution at 37° to 38° C. and recording its normal contraction upon a kymograph. The vas is then tested as to its activity with a small dose (0.1 milligram of Adrenalin) in 50 cc. of Locke's solution and, after washing the organ, it is again tested with a glandular product and the degree of contraction is compared with the standard contraction of Epinephrine.

In connection with such routine examinations of glandular products by means of *vas deferens* it was noted that the *vasa deferentia* of certain rats were less sensitive to the effects of Epinephrine and Corpus Luteum extracts than the *vasa deferentia* of other rats; that is the absolute height of contraction obtained with some vas preparations was much greater than the height of contraction obtained with other vas preparations although a comparison of the activity of Corpus Luteum and Epinephrine always gave the same ratio. In seeking for an explanation of the above phenomenon attention was called by the author's technician, Charles Kamphaus, to the fact that some of the male rats were completely isolated while other male rats were kept in close proximity to female rats. Accordingly careful and extensive observations were begun in order to ascertain whether sexual excitement had any bearing on the height of the contraction exhibited in the isolated vas by various drugs. A group of white rats were kept in clean cages completely isolated and far away from any female rats, and another group of rats of exactly the same stock and pedigree were kept in another cage which was placed next to a third cage containing females of the same species. All the animals were fed on exactly the same rich diet of Prof. McCollum with an abundance of vitamines, and all other conditions were maintained the same in both groups of rats. It was found that the male animals, kept in proximity to the females showed definite signs of sexual excitement, and it was found almost invariably when such rats were killed and their *vasa deferentia* were used for testing drugs, that their response was much greater than the *vasa deferentia* obtained from the group of rats which were kept isolated and kept entirely apart from any female rats. This difference in the degree of contractility of the *vasa deferentia* was not due to any macroscopic difference in

the length or thickness of the vas examined but seems to be due to a greater sensitiveness of those organs in the one group of animals. The subjoined illustrations, Figs. 1 and 2, give an excellent idea of the results obtained. In Fig. 1 are shown the contractions obtained with *vasa deferentia* excised from segregated male rats. It will be noted that these preparations showed normal rhythmic contractions of the organs and gave a definite response to Epinephrine (Ep.) and various Corpus Luteum extracts (179–180). On the other hand in Fig. 2 are shown *vasa deferentia* excised from male rats belonging to the "promiscuous" stock and in this case it will be noted that the contractions obtained with exactly the same quantity of Epinephrine and Corpus Luteum extracts were much higher than in the preceding. The same was found true of male rats which were kept together with females in the same cage. We do not think that the difference is an accidental one because these observations have been carried on for a long time and were repeatedly found to hold good. It would seem that sexual excitement of the male kept in proximity to the female renders *vas deferens* more sensitive to certain drugs.

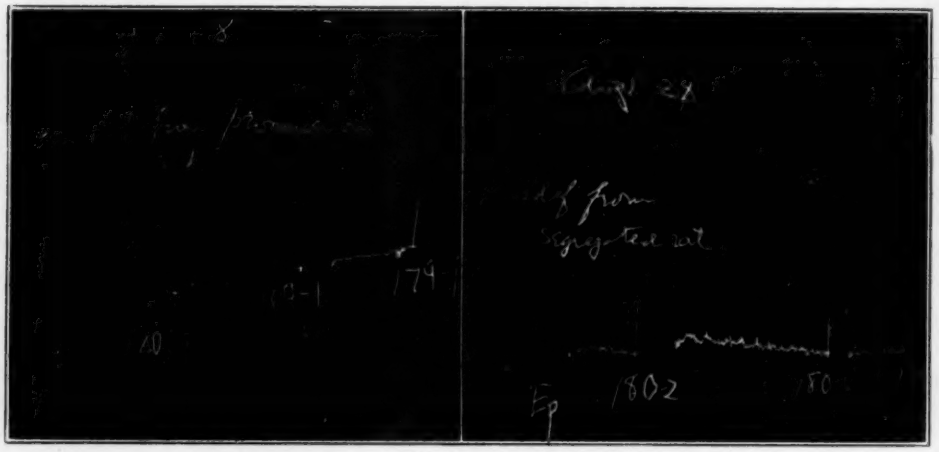

Fig. 1.—Response of normal vas deferens of segregated rat to Epinephrine 0.1 milligram in 50 cc. of Locke's Solution and Corpus Luteum Extract 1 cc. in 50 cc. of Locke's Solution.

Fig. 2.—Response of normal vas deferens of promiscuous stock to Epinephrine 0.1 milligram in 50 cc. of Locke's Solution and Corpus Luteum 1 cc. in 50 cc. of Locke's Solution.

## CONCLUSION.

The evidence adduced seems to point to the conclusion that the *vasa deferentia* of rats kept under continuous sexual excitement and activity are more sensitive to Epinephrine and Corpus Luteum extracts than the *vasa deferentia* of control male rats kept isolated and apart from proximity of any female animals.

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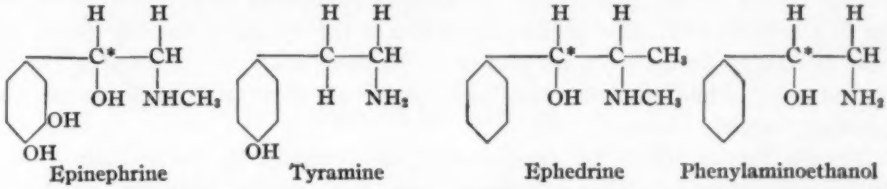
# CHEMICAL EXAMINATION OF α-PHENYL-β-AMINO-ETHANOL SULPHATE.*

BY SAMUEL M. GORDON.

The varied therapeutic uses of epinephrine have created for it a demand that has led manufacturers and others to find in place of it compounds, either natural or synthetic, with variations within the molecule. Some of the variations have already found wide use; namely, ephedrine, isolated from Ma-Huang and tyramine, originally isolated from Ergot, but now prepared synthetically. Recently, a substance closely related to the three preparations described above has been described in the medical literature. More recently, a report detailing the clinical application of phenylethanolamine sulphate was submitted to the *Journal of the American Medical Association*.[1] As is the custom with papers dealing with new therapeutic agents the Council on Pharmacy and Chemistry was requested to make a preliminary report on the drug. In this connection, the Chemical Laboratory of the American Medical Association was asked to investigate the chemical constitution and character, and to elaborate standards for the drug.

Alles[2] has recently reported on the physiologic action of phenylethanolamine, or more specifically α-phenyl-β-aminoethanol. The compound has been previously described by others, notably by Mannich and Thiele,[3] who also prepared a number of derivatives and homologues of the compound.

A comparison of the structural formulas of epinephrine, ephedrine, tyramine and phenylaminoethanol[4] will serve to bring out the similarities and conversely the differences in their chemical nature.




It will be noted that the side chain of ephedrine contains three carbons, while the other three contain two; the former being a derivative of propyl benzene; the other three being derivatives of ethyl benzene. Epinephrine and tyramine both contain hydroxyl groups in the nucleus, hence may be expected to be more prone to oxidation, a serious objection pharmaceutically and therapeutically. Ephe-

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* Contribution from the American Medical Association Chemical Laboratory.

[1] *J. A. M. A.*, 91 (1928), 1033.

[2] *J. Pharmacol.*, 32 (Dec. 1927), 121.

[3] *Archiv der Pharmazie*, 253 (1915), 181.

[4] The Council on Pharmacy and Chemistry of the American Medical Association has suggested that α-phenyl-β-aminoethanol sulphate be referred to as phenylaminoethanol sulphate. *J. A. M. A.*, 91 (1928), 1037.

drine and phenylaminoethanol being devoid of nuclear hydroxyl groups may be expected to be more resistant to oxidation, a fact which has been borne out in practice.[1,5] Phenylaminoethanol differs, however, from ephedrine in one important respect. Ephedrine base can be quantitatively extracted from its alkaline solution with ether. Phenylaminoethanol, on the other hand, decomposes into benzaldehyde, even in the presence of dilute ammonia water. This behavior was rather surprising, in view of the observation of Mannich and Thiele,[3] who found that the compound was stable in the presence of boiling 20 per cent hydrochloric acid and 15 per cent potassium hydroxide, which fact was confirmed by the writer. The concentration of the base used is probably a determining factor. A weighed quantity of phenylaminoethanol sulphate dissolved in water was treated with 15 per cent potassium hydroxide solution and boiled. No ammonia or benzaldehyde was revealed by appropriate tests. On the other hand, attempts to extract the free base from alkaline solution with ether and spontaneous evaporation of the ether gave far from quantitative results. In every attempt a pronounced odor of benzaldehyde was noticeable. The formation of benzaldehyde was confirmed by the isolation of benzaldehydephenylhydrazone melting at 154° C. Unfortunately, the decomposition does not proceed quantitatively, since it was hoped to take advantage of this behavior in the elaboration of a suitable assay method. Lack of time did not permit the study of this behavior in as great detail as the reaction apparently deserves.

Phenylaminoethanol is isomeric with tyramine (para-hydroxyphenylethylamine), the difference being in the position of the hydroxyl group. In the latter, the hydroxyl group is in the benzene nucleus, while in phenylaminoethanol the hydroxyl group is found in the side chain. This difference of position of the hydroxyl group at once suggests important differences, which may be used for their distinction.

The nuclear hydroxyl of tyramine gives it phenolic characteristics, while the position of the hydroxyl group in the side chain of phenylaminoethanol is responsible for its secondary alcoholic nature and introduces an asymmetric carbon atom in the molecule. The present specimen is the synthetic racemic form, but it may be distinguished from its isomer by Millon's reagent. Tyramine gives a deep red color, while phenylaminoethanol yields a yellow precipitate, in no wise suggesting phenolic characteristics.

The product available for examination was prepared by the reduction of $\alpha$-phenyl-$\beta$-nitroethanol.[1] The substance was fine, white, odorless, crystalline powder, possessing a bitter taste. It was readily soluble in hot water. It melted at 250–254° C. (corrected, U. S. P. X Method). It was optically inactive. In order to determine the homogeneity of the product, the coöperation of Prof. A. J. Walcott, professor of mineralogy and crystallography at Northwestern University, was secured. His report, which follows, indicates that the product is pure.

"Optical crystal properties of Racemic $\alpha$-phenyl-$\beta$-amino ethanol sulphate. Biaxial; optically positive; 2 E medium; pronounced dispersion of optic axes showing violet greater than red; crystals are thin, flat and somewhat oblong. The majority show the habit of Fig. 1.

[1] Personal communication of Dr. Gordon A. Alles.

"The flat surface of the crystal is very nearly perpendicular to the acute bisectrix.

"The following indices of refraction have been determined:

$$\alpha = 1.561 \pm 0.001$$
$$\beta = 1.581 \pm 0.001$$

"No evidence has been observed to indicate the presence of an impurity."

Fig. 1.

Fig. 2.

SOME CHEMICAL REACTIONS.

An aqueous solution of $\alpha$-phenyl-$\beta$-aminoethanol sulphate yields a purple color immediately when treated with copper sulphate and sodium hydroxide. The color is discharged by acids and is insoluble in ether.

Benzaldehyde and phenylaminoethanol hydrochloride are formed when the base is extracted from alkaline solution with chloroform. This behavior has been noted in the case of ephedrine.[1]

The compound decomposes into benzaldehyde when treated with dilute alkali solutions. The following reaction is suggested to account for the formation of benzaldehyde:

$$C_6H_5CHOHCH_2NH_2 \longrightarrow C_6H_5CHO + CH_3NH_2$$

The substance readily yields an odor of carbylamine on treatment with potassium hydroxide and chloroform. This behavior distinguishes the compound from its homologue, ephedrine.

With Millon's reagent it yields a yellow precipitate unchanged by heating.

In aqueous solution it yields precipitates with phosphotungstic acid and palladium chloride, but with none of the other alkaloidal reagents tried.

The compound readily forms a picrolonate which melts sharply at 200–201° C. (corrected). It readily yields a monobenzoyl derivative, melting sharply at 149.5–150° C. (corrected).[2]

Moisture determinations were carried on over a period of hours. The product was apparently anhydrous and stable. The results of the determinations are given in Table I.

TABLE I.

MOISTURE DETERMINATIONS.

| | 6 hrs. | 12 hrs. | 24 hrs. | 48 hrs. | 72 hrs. | 120 hrs. |
|---|---|---|---|---|---|---|
| Loss in weight by drying at 100° C. | 0.25[1] | 0.25 | 0.25 | 0.33 | Constant | weight. |
| Loss in weight by drying at 120° C. | 0.22 | 0.22 | 0.32 | Constant weight. | | |
| Loss in weight over Sulphuric Acid | 0.02 | | Constant weight. | | | |
| Loss in weight over Potassium Hydroxide | 0.00 | | Constant weight. | | | |
| Loss in weight over Phosphorus Pentoxide | 0.01 | | Constant weight. | | | |

[1] Figures are reported in terms of percentage.

Quantitative determinations showed the compound to be of a good grade of purity. The results are tabulated in Table II.

[1] J. B. Peterson, *Ind. Eng. Chem.*, 20 (1928), 388; cp. W. A. Puckner, *Am. J. Pharm.*, 80 (1908), 72.

[2] Cp. F. Wolfheim, *Ber.*, 47 (1914), 1440.

From the analytical data, together with certain of the foregoing tests, it is concluded that the specimen of $\alpha$-phenyl-$\beta$-aminoethanol sulphate examined is a pure product. The free base, however, is unstable in a dilute alkaline medium, decomposing into benzaldehyde and an amine, possibly of a volatile nature. The instability of the free base in dilute alkaline medium indicates that in common with many other products, therapeutic effects arising from the decomposition products are possible.

TABLE II.

RESULTS OF THE QUANTITATIVE DETERMINATIONS.

| | Found. | | Theory. |
|---|---|---|---|
| | Original specimen. | Calculated to the dried specimen. | Calculated for $[C_6H_5CHOHCH_2NH_2]_2.H_2SO_4$. |
| Moisture (loss by drying at 120° C.) | 0.32[1] | ... | ... |
| Nitrogen (N) | 7.25 | 7.27 | 7.52 |
| Sulphuric acid ($H_2SO_4$) | 26.72[2] | 26.79 | 26.34 |
| Free base ($C_6H_5CHOHCH_2NH_2$) | ... | ... | 73.65 |
| Ash | 0.11 | ... | ... |

[1] Figures are reported in terms of percentage.

[2] Average of 4 determinations.

Based in part on the information in the literature and in part on the examination of the specimen of $\alpha$-phenyl-$\beta$-aminoethanol sulphate described above, the following standards are suggested:

PHENYLAMINOETHANOL SULPHATE.—*Phenylaminoethanolae Sulphas.*—Phenylethanolamine sulphate.—Racemic alpha-phenyl-beta-aminoethanol sulphate.—Racemic-1-phenyl-2-amino ethan-1-ol sulphate. $[C_6H_5CHOHCH_2NH_2]_2.H_2SO_4$. The sulphate of an alkaloid obtained synthetically.

Phenylaminoethanol sulphate occurs as fine, odorless, white crystals. It is readily soluble in water and hot alcohol, but more difficultly soluble in cold alcohol. The water solution is neutral to litmus. It is optically inactive. It melts between 250–254° C. (corrected). The rate of heating must be *strictly* according to the method of U. S. P. X.

Dissolve 0.01 Gm. of phenylaminoethanol sulphate in 1 cc. of water and add 0.1 cc. of copper sulphate solution (10 per cent), followed by 1 cc. of sodium hydroxide (20 per cent). A purple color appears at once. The color is not extractable by ether.

Dissolve 0.1 Gm. of phenylaminoethanol sulphate in 10 cc. of water, add 1 cc. of ammonia water and shake out with two 15-cc. portions of chloroform, filter the chloroform and allow to evaporate spontaneously. Take up the residue in 5 cc. of water, filter. To 1 cc. of the filtered solution add 3 drops of diluted nitric acid and 1 drop of silver nitrate solution. A white precipitate forms. To 1 cc. of the filtered residue add 1 cc. of Fuchsin-sulphurous acid solution. A red coloration forms at once.

To 0.005 Gm. phenylaminoethanol sulphate contained in a test-tube add a solution containing 0.2 Gm. of potassium hydroxide in 1 cc. of 50 per cent alcohol and 3 drops of chloroform. Boil gently. A strong carbylamine odor is evolved. (*Distinction from ephedrine.*)

To 0.005 Gm. of phenylaminoethanol sulphate dissolved in 1 cc. of water add one drop mercurous nitrate solution and boil. A yellow precipitate unchanged by heating forms. (*Distinction from tyramine.*)

To 0.005 Gm. of phenylaminoethanol sulphate dissolved in 1 cc. of water add one drop of 1 per cent ferric chloride solution. No coloration is produced. (*Distinction from epinephrine.*)

To 0.2 Gm. of phenylaminoethanol sulphate dissolved in 10 cc. of water add 7 cc. of a saturated alcoholic solution of picrolinic acid and allow to stand 12 hours. Filter the crystals and dissolve it in 15 cc. of hot water, filter and allow the filtrate to cool. Fine, yellow, silky crystals which, after filtering and drying, melt sharply between 200–201° C. (corrected) are obtained.

Dissolve 0.1 Gm. of phenylaminoethanol sulphate in 10 cc. of water, add an equal volume of potassium hydroxide solution (15 per cent) and boil. The vapors do not cause a strip of moist red litmus paper held above the tube to turn blue.

To 1 cc. of a solution containing 0.01 Gm. of phenylaminoethanol sulphate, add 4 drops of diluted hydrochloric acid, followed by 1 drop of barium chloride solution; a white precipitate forms.

Dissolve 0.05 Gm. of phenylaminoethanol sulphate in 30 to 40 cc. of distilled water, add 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution. No turbidity should result (*absence of chloride*).

A solution of 0.2 Gm. phenylaminoethanol sulphate dissolved in 10 cc. of water should yield a negative test for heavy metals when tested according to the U. S. P. X method (see U. S. P. X, page 439).

Dissolve about 0.3 Gm. of phenylaminoethanol sulphate, accurately weighed, in 200 cc. of water, add 1 cc. of diluted hydrochloric acid, followed by sufficient barium chloride solution to precipitate all the sulphate, allow to stand in a warm place for 6 hours, transfer the precipitate to a previously prepared Gooch crucible, wash well with hot water and then with cold water, dry at 120° C., cool in a desiccator and weigh: the sulphate ($SO_4^{--}$) calculated from the barium sulphate weighed is not less than 25.7 per cent, nor more than 26.3 per cent.

Transfer about 0.3 Gm., accurately weighed, to a 500-cc. Kjeldahl flask and determine the nitrogen content according to the method described in Medical War Manual No. 6, Laboratory Methods of the United States Army, page 221. The percentage of nitrogen corresponds to not less than 7.20 per cent, nor more than 7.80 per cent, when calculated to the dry substance.

The ash from 0.1 Gm. does not weigh more than 0.0001 Gm.

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## EPINEPHRINE, PHYSIOLOGICAL ACTION.

Influence of adrenaline on new sugar formation. E. Geiger and Schmidt—*Arch. exptl. Path. Pharmakol.*, 134 (1928), 173; through *Squibb's Abstract Bulletin.* Adrenaline treatment of phloridzin-diabetic dogs produces an increase of the quotient D/N (corresponding to the formation of sugar from fat) only once; this primary increase (not repeated with a subsequent administration) is due to the emptying of the muscle glycogen depot. Adrenaline does not change the fat content of the liver of these animals, which likewise speaks against the assumption that adrenaline promotes carbohydrate formation from fat. Adrenaline mobilizes muscle glycogen, which leads to a reduction of the albumin metabolism (which is pathologically increased by phloridzin) and likewise to an inhibition of the excretion of acetone bodies, which two phenomena are due simply to the liberated muscle sugar.—E. G.

## EPHEDRINE, SYNTHESIS.

Synthesis of ephedrine and structurally similar compounds. R. H. F. Manske and T. B. Johnson—Meeting Am. Chem. Soc., Div. Org. Chem., 4 (Sept. 1928); through *Squibb's Abstract Bulletin.* In view of the interest aroused in the pharmacology of the alkaloid, ephedrine, by the work of K. K. Chen, the authors thought it desirable to study synthetic methods which might lead not only to ephedrine, but also to structurally similar bases. Späth's brilliant synthesis leaves no room for doubt regarding the constitution of this substance but his synthetical procedure is too involved to be of any value as a preparative method. The authors, after considerable work on the more obvious methods, finally developed the following surprisingly simple scheme which has been applied with success to a large number of amino alcohols including ephedrine.

$$C_6H_5CO.C.CH_3 + CH_3NH_2 \rightarrow C_6H_5.CO.C.CH_3 + H_2O$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad \| \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad NCH_3$$

$$C_6H_5CO.C.CH_3 + 2H_2 \rightarrow C_6H_5CH.CH.CH_3$$
$$\qquad\quad \| \qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad | \quad |$$
$$\qquad NCH_3 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad OH\ NHCH$$

The alkaryl-diketone and a primary amine are dissolved in alcohol and the solution-mixture is reduced at once by means of hydrogen under pressure and in the presence of a catalyst.

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**May you have the joys of the Christmas season and, in 1929, the happiness of health and success.**

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Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

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# THE INCOMPATIBILITY OF SODIUM SALICYLATE AND SODIUM BICARBONATE MIXTURES.*

BY JOHN C. KRANTZ, JR.

## INTRODUCTION.

It is surprising indeed to consider the number of substances incompatible with sodium bicarbonate in aqueous solution. Ricciardelli (1), in a summary of these cases, calls attention to the facts that borax in the presence of glycerin liberates carbon dioxide from this compound: its presence in solution with quinine salts causes the precipitation of the alkaloid; with magnesium oxide quantities of sodium hydroxide are formed and with diuretin a cleavage into theobromine and sodium salicylate results. Scoville (2) calls attention to the darkening of sodium salicylate in aqueous solution in the presence of sodium bicarbonate and suggests the cause of darkening to be oxidation. It was further recorded by Scoville that sodium hydroxide did not cause this darkening as readily as did sodium carbonate or sodium bicarbonate. Greenish and Beesley (3) studied the darkening of solution of sodium salicylate upon standing. The frequent observation of the rapid darkening of sodium bicarbonate and sodium salicylate in aqueous suggested the present investigation to the author.

## EXPERIMENTAL.

Samples of chemically pure sodium salicylate and sodium bicarbonate were obtained that did not give a positive reaction for iron. As this combination often is prescribed on physicians' prescriptions—one dram each in two fluidounces of solution—this concentration was employed as the basis for study.

Fig. 1.—See tables.

*Action of Bicarbonate, Carbonate and Hydroxide.*—Using the foregoing concentrations as a basis, solutions were prepared containing the bicarbonate, carbonate and hydroxide of sodium, respectively, and sodium salicylate. The concentrations of the carbonate and hydroxide were molecularly equivalent to the foregoing concentration of sodium bicarbonate. These solutions were prepared in boiled distilled water and their hydrogen-ion concentrations measured electrometrically. The following table records the observations made upon these solutions stored in flint bottles.

TABLE I.

| | | | |
|---|---|---|---|
| *1.* | Sodium salicylate + Sodium bicarbonate | 7.97 $p_H$ | Intensely black with ppt. in 6 days |
| *2.* | Sodium salicylate + Sodium carbonate | 10.55 $p_H$ | Brown in 10 days |
| *3.* | Sodium salicylate + Sodium hydroxide | 12.86 $p_H$ | Practically colorless after several months |

Figure 1 shows Samples 1 and 3 after one month's standing.

*Influence of* $p_H$.—One might judge from the foregoing results that the darkening

* Section on Practical Pharmacy and Dispensing, Portland, Me., meeting, 1928.

was a function of the hydrogen-ion concentration and that, if the hydroxyl-ion concentration of the solution were sufficiently increased, the darkening would not take place.

In order to ascertain the influence of hydrogen-ion concentration upon the darkening of the salicylate several solutions of sodium salicylate of the before mentioned concentration were prepared in solutions of sodium hydroxide of definite $p_H$. Table II records the observations upon these solutions.

TABLE II.

| | | | After 3 months. |
|---|---|---|---|
| *1.* | Sodium salicylate in NaOH sol. | $p_H$ 7.55 | Very light yellow |
| *2.* | Sodium salicylate in NaOH sol. | $p_H$ 8.02 | Yellow |
| *3.* | Sodium salicylate in NaOH sol. | $p_H$ 9.25 | Yellow |
| *4.* | Sodium salicylate in NaOH sol. | $p_H$ 10.97 | Light brown |
| *5.* | Sodium salicylate in distilled water | $p_H$ 6.63 | Colorless indefinitely |
| *6.* | Sodium salicylate in distilled water | $p_H$ 8.95 | After one week |
| *7.* | Sodium salicylate in distilled water saturated with salicylic acid | $p_H$ 4.41 | Colorless indefinitely |

Unlike the observations made from Table I the darkening increased with an increase of hydroxyl-ion concentration up to $p_H$ 10.97 when the alkalinity was produced by free alkali, instead of alkali bicarbonate or carbonate.

*Influence of the Positive Ion.*—In order to study the influence of the positive ion upon the discoloration of the solution, the carbonates of lithium and ammonium and the bicarbonate of potassium were studied. Table III records these observations. Molecular equivalents of the other ions were employed.

TABLE III.

| | | | |
|---|---|---|---|
| *1.* | Sodium salicylate + Sodium bicarbonate | 7.97 $p_H$ | Intense black in 6 days |
| *2.* | Sodium salicylate + Sodium carbonate | 10.55 $p_H$ | Brown in 10 days |
| *3.* | Sodium salicylate + Potassium bicarbonate | 8.27 $p_H$ | Intense black in 6 days |
| *4.* | Sodium salicylate + Lithium carbonate | 10.63 $p_H$ | Brown in 10 days |
| *5.* | Sodium salicylate + Ammonium carbonate | 9 + colorimetric | Brownish black in 10 days |

These results indicate that changing the alkali ion in combination with the ion of carbonic acid does not influence the rate or degree of darkening of sodium salicylate in aqueous solution.

*Action of Bicarbonate upon Compounds Related to Sodium Salicylate.*—Samples of solution of sodium bicarbonate and the sodium salts of meta and para hydroxy benzoic acids were prepared and their permanence studied. In order to determine whether it was necessary to have the hydroxyl and carboxyl groups in the same molecule and which was responsible for the darkening, solutions were prepared containing sodium benzoate, phenol and mixtures of sodium benzoate and phenol. Table IV records the observations made in this series of experiments.

TABLE IV.

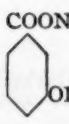
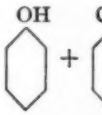
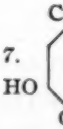
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *1.* |  | + $NaHCO_3$ | No discoloration | *2.* | | + $NaHCO_3$ | No discoloration |

TABLE IV (*Concluded*).

| | | |
|---|---|---|
| 3. | + $NaHCO_3$ | After four mos. slightly pink |
| 4.  | + $NaHCO_3$ | After four mos. a light brown color |
| 5. | + $NaHCO_3$ | No discoloration |
| 6. | + $NaHCO_3$ | After three months a very light brown color |
| 7.  | + $NaHCO_3$ | After three months a very light brown color, slightly darker than plain sodium gallate solution |

These results indicate that in certain related compounds a darkening similar to that observed in sodium salicylate solutions does occur, but only to a far lesser degree than that with sodium salicylate. It is of special interest to note that neither the meta nor the para hydroxy benzoic acid reacts similarly to the ortho variety.

*Influence of Oxidation and Reduction.*—Several samples of sodium salicylate and sodium bicarbonate mixture were stored in containers in which the space above the liquid was evacuated, filled with hydrogen and carbon dioxide, respectively. The exclusion of the atmospheric air (presumably in part only) retarded the development of the black pigment, yet after a sufficient period of time had elapsed (3 weeks) these samples became black and showed a black amorphous deposit. Solution of hydrogen peroxide brings about incipient darkening within a period of fifteen minutes, whereas a small quantity of sodium hypophosphite will keep the solution colorless for a long period of time. This indicates that one of the principal factors involved in the darkening is oxidation.

*Influence of Various Radiations.*—Samples stored in colorless, purple, red and green pyrex tubes did not vary much in the rate of discoloration. Samples stored in plain and amber tubes exposed and not exposed to ultraviolet radiation did not vary appreciably in the rate of darkening. This would seem to imply that light is not an important factor in the reaction.

*The Physical Properties of the Precipitate.*—The deposit obtained is black and amorphous. It has a tendency to pass through ordinary filter paper, presumably in a colloidal state. The substance is insoluble in water and alcohol. Warm concentrated hydrochloric acid and five per cent sodium hydroxide, respectively, fail to exert a solvent influence upon it. In warm nitric acid the material dissolves to form a red solution with the liberation of the nitrogen dioxide.

## CONCLUSIONS.

1. The nature of the incompatibility of sodium salicylate and sodium bicarbonate in aqueous solution has been studied.

2. The reaction has been shown to be accelerated by oxygen and considering the compounds investigated, it is peculiar to ortho hydroxy benzoic acid.

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(2) Scoville, "Art of Compounding," 408, Blakiston's Son & Co., Philadelphia.
(3) Greenish and Beesley, *Pharm. J.*, 94 (1915), 201.

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## THE EFFECT OF HEAT ON TRAGACANTH AND ITS MUCILAGE.*

BY L. F. GABEL.

The consistency of Mucilage of Tragacanth varies greatly when it is prepared under different conditions. The mucilage made without the application of heat is decidedly more fluid than the mucilage subjected to boiling for several minutes.

If the mucilage is boiled for 15 minutes, a very fluid preparation results. On the other hand, when the mucilage is boiled but two minutes, it remains viscous. Further, an increase in viscosity has been noted upon aging the mucilage prepared by bringing it to a boil, and then removing the source of heat.

These facts prompted the investigation presented in this paper.

Evers and MacLachlan (Year Book of Pharmacy (British) (1927), 504) generalized upon the above facts, but apparently did not investigate the range of viscosity changes produced in the Mucilage of Tragacanth when it is subjected to varying boiling periods.

The object of these experiments was twofold: (1) To secure a mucilage which will remain constant in viscosity. (2) Production of a mucilage of maximum viscosity.

The mucilage used in all the experiments conducted for this paper was prepared from the following formula:

| | |
|---|---|
| Powdered Tragacanth | 54 grains |
| Glycerin | 2 ounces, avoir. |
| Water (60° C.), to make | 8 ounces avoir. |

The powdered tragacanth was mixed in a mortar with the glycerin and 6 fluid-ounces of water (60° C.) added slowly with constant stirring. The mucilage was transferred to a tared casserole and the mortar rinsed with a small amount of water, and the rinsing added to the mucilage in the casserole.

The following variations of time of boiling were established:

1. No application of heat
2. Mucilage brought to a boil (required four minutes for each experiment)
3. Mucilage boiled one minute
4. Boiled two minutes
5. Boiled three minutes
6. Boiled four minutes
7. Boiled five minutes
8. Boiled six minutes
9. Boiled seven minutes
10. Boiled eight minutes
11. Boiled nine minutes
12. Boiled ten minutes
13. Boiled twelve minutes
14. Boiled fifteen minutes

The following regulations were maintained throughout all the experiments: The casserole containing the mucilage was placed on a tripod, supported by an

* Section on Practical Pharmacy and Dispensing, Portland, Me., meeting, 1928.

asbestos-centered wire gauze and held three and a half inches above the top of the Bunsen burner. The burner was regulated to deliver a 7-inch flame and all the mucilages were boiled vigorously, with the same intensity of heat applied on each experiment.

At the conclusion of the boiling period the mucilage in the tared casserole was weighed and sufficient water added to bring the weight of the mucilage to eight ounces. In experiments No. 5 to No. 14, sufficient excess of water was added when the mucilage was prepared to balance the loss of water due to evaporation over the longer boiling periods. A preservative was added to all experiments. The experiments were transferred to bottles, corked and allowed to stand one week before noting the viscosity of the mucilage.

The viscosity of the mucilage was determined by the use of the descending ball method and also by the MacMichael Viscosimeter. The descending ball method consisted of determining the number of seconds required for a standard metallic ball ($^1/_4$-inch ball bearing—weight, 1.0446 Gm.) to descend through a six-inch column of the mucilage, at room temperature. The MacMichael Viscosimeter readings were obtained by noting the twist imparted to a standardized wire (No. 22) by action on a suspended disc plunger in the mucilage held in a container rotating at constant speed (8 r. p. m.).

The table below shows the results obtained by the above described methods on a series of four mucilages of each experiment.

TABLE I.

| | | Viscosity of mucilage of tragacanth. | | | |
|---|---|---|---|---|---|
| | Length of time of boiling mucilage. | Descending ball method, no. of seconds required. | Average. | MacMichael viscosimeter. | Average. |
| *1.* | No application of heat | 109, 115, 117, 106 | 112 | 151, 160, 151, 142 | 151 |
| *2.* | Brought to boil | 226, 245, 251, 233 | 234 | 193, 200, 181, 187 | 190 |
| *3.* | Boiled 1 minute | 340, 301, 315, 325 | 320 | 218, 214, 211, 201 | 211 |
| *4.* | Boiled 2 minutes | 330, 376, 318, 309 | 333 | 203, 217, 212, 190 | 205 |
| *5.* | Boiled 3 minutes | 272, 248, 307, 295 | 281 | 170, 158, 144 | 157 |
| *6.* | Boiled 4 minutes | 184, 168, 192 | 181 | 152, 163, 141 | 145 |
| *7.* | Boiled 5 minutes | 165, 156, 150 | 157 | 130, 148, 150 | 142 |
| *8.* | Boiled 6 minutes | 115, 140, 107, 122 | 121 | 130, 142, 146 | 137 |
| *9.* | Boiled 7 minutes | 45, 62, 44 | 50 | 100, 95, 125 | 107 |
| *10.* | Boiled 8 minutes | 24, 30, 23 | 26 | 78, 85, 65 | 76 |
| *11.* | Boiled 9 minutes | 16, 20, 21 | 19 | 87, 70, 64 | 73 |
| *12.* | Boiled 10 minutes | 11, 12, 19 | 14 | 54, 51 | 52 |
| *13.* | Boiled 12 minutes | 8, 6 | 7 | 44, 51 | 47 |
| *14.* | Boiled 15 minutes | 3, 4 | 4 | 28, 35 | 32 |

The mucilages prepared without heating, and also the mucilages subjected to a boiling period greater than two minutes were decidedly more fluid than the mucilages boiled for one and two minutes. The viscosity of the mucilages drops sharply when boiled longer than the two-minute period.

The following curve shows the rapid increase in viscosity up to the two-minute boiling period, as well as the sharp decrease beyond this boiling time.

The abscissa represents the length of boiling time and the ordinate, in the case of the descending ball method, the number of seconds required for the ball to descend through a six-inch column of mucilage.

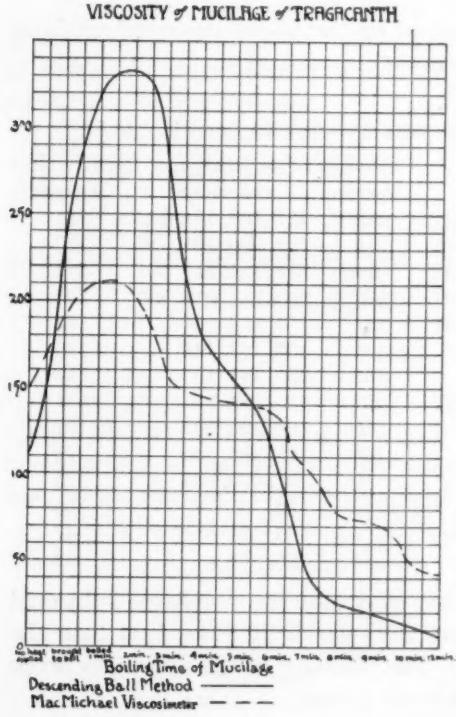
All the experiments recorded in the above table were returned to the bottles,

corked and allowed to age for three months. The viscosity determinations were repeated.

TABLE II.

| Length of time of boiling. | Viscosity of mucilage of tragacanth after aging three months. Descending ball method, no. of seconds required. | Average. |
|---|---|---|
| No application of heat | 186, 201, 179, 177 | 181 |
| Brought to boil | 407, 347, 438, 399 | 398 |
| Boiled 1 minute | 618, 602, 555 | 592 |
| Boiled 2 minutes | 577, 396, 483, 519 | 501 |
| Boiled 3 minutes | 310, 351, 334 | 332 |
| Boiled 4 minutes | 130, 165, 135 | 142 |
| Boiled 5 minutes | 130, 149, 141 | 140 |
| Boiled 6 minutes | 105, 91, 92 | 96 |
| Boiled 7 minutes | 45, 73, 40 | 51 |
| Boiled 8 minutes | 26, 25, 19 | 23 |
| Boiled 9 minutes | 22, 17, 14 | 18 |
| Boiled 10 minutes | 7, 9 | 8 |

Marked increase in viscosity occurred in the mucilages prepared by boiling one minute, two minutes and also the experiments prepared by heating to 100° C.




The three months' aging period revealed that the experiments subjected to one and two minutes' boiling produces a mucilage that thickens considerably on standing.

Experiments subjected to three minutes' boiling produce a mucilage which remains more uniform upon aging than all other experiments.

Comparing Table I with II, we find that the mucilage prepared by boiling three minutes gave an increase from 281 to 332 upon aging three months, whereas mucilages made by boiling one and two minutes, respectively, increased from 320 and 333 to 592 and 501, after standing three months.

### EFFECT OF HEAT ON POWDERED TRAGACANTH.

Our attention was called to the fact that gum tragacanth of the same shipment varied greatly upon preparing mucilages with powdered gum selected from different sections of the lot. One section of the shipment produced a mucilage of correct consistency, whereas another part of the same lot made a mucilage which was decidedly too fluid.

In the process of powdering the gum, considerable heat is developed. The tragacanth remains in the mill for a long period of time, and in the course of grind-

ing, sufficient heat evolves to produce a deleterious effect on the gum. The part lot of the tragacanth entering the mill last comes in contact with a greater degree of heat than the first section of the lot. Therefore, the mucilage prepared from the final section of the gum passing through the mill should be more fluid than the mucilage resulting from the first part of the lot.

Experiments were conducted to note the effect varying degrees of heat had upon powdered tragacanth. The formula for the mucilage used in the first part of this paper was adhered to in these experiments and all the mentioned regulations observed. Fifty-four-grain samples of selected powdered tragacanth were subjected to the following treatment:

Four samples were dried over calcium chloride at room temperature.
Four samples were heated at 45° C. for two hours.
Four samples were heated at 45° C. for eight hours.
Four samples were heated at 80° C. for two hours.
Four samples were heated at 80° C. for eight hours.
Four samples were heated at 100° C. for two hours.
Four samples were heated at 100° C. for eight hours.

The samples of the powder were removed from the source of heat, and the mucilage prepared. Each experiment was boiled three minutes and the mucilages were allowed to age one week in corked bottles before taking the relative viscosity.

The following results were obtained:

TABLE III.

Viscosity of mucilage of tragacanth (prepared with heat-treated powdered tragacanth).

| Variation in heat applied to powdered tragacanth. | Descending ball method (no. sec. req. for 1/4" ball to descend 66" column of mucilage). | Average. | MacMichael viscosimeter. | Average. |
|---|---|---|---|---|
| Dried over $CaCl_2$ at room temp. | 44, 54, 89, 67 | 63 | 90, 102, 134, 93 | 105 |
| No heat applied | 330, 376, 318, 309 | 333 | 203, 217, 212, 190 | 205 |
| 45° C. for 2 hrs. | 286, 298, 329, 293 | 301 | 200, 180, 197 | 192 |
| 45° C. for 8 hrs. | 293, 281, 278, 326 | 294 | 182, 208, 190 | 193 |
| 80° C. for 2 hrs. | 87, 122, 112, 100 | 105 | 144, 137, 138 | 140 |
| 80° C. for 8 hrs. | 44, 51, 40 | 45 | 88, 81, 96 | 88 |
| 100° C. for 2 hrs. | 43, 52, 56 | 50 | 101, 85, 84 | 90 |
| 100° C. for 8 hrs. | 28, 27, 25 | 27 | 57, 70, 77 | 68 |

The above results show a tremendous loss in viscosity of the mucilage prepared with powdered tragacanth which has been heated at 80° and 100° C., and a very slight loss at 45° C. Comparing the samples of mucilage with powdered tragacanth (not heated) with mucilage made with powdered gum (heated at 80° C. for 2 hours), a drop in viscosity from 333 to 91 is recorded, which presents such a great difference that the effect of heat on powdered tragacanth is unmistakable.

There does not seem to be any possibility of avoiding the heat developed in milling the gum, although it would be advisable to powder but a small amount of the tragacanth at a time, thoroughly mix and submit a sample to a definite standardized test, such as described in this paper.

Evers and MacLachlan call attention to the advisability of storing the powdered gum in the presence of moist atmosphere. In their investigation they found that deterioration of the tragacanth takes place upon loss of moisture of the pow-

dered gum. In our experiments we found that the powdered tragacanth, dried over calcium chloride at room temperature, produced a mucilage which showed a decrease in viscosity from 333 (tragacanth containing moisture) to 63. This enormous decrease in viscosity makes it imperative that powdered tragacanth should be stored with provision to avoid loss of moisture.

In attempting to arrive at the cause of the above changes which take place in tragacanth when it is subjected to heat, we found the following interesting facts:

TABLE IV.

| Powdered tragacanth samples. | Moisture content (dried over $CaCl_2$ for 6 weeks), %. | Total volatile matter (100° C. for 2 days), %. | % Acid (as acetic acid) in samples dried over $CaCl_2$. | % Acid (as acetic acid) dried at 100° C. | % Acid (as acetic acid) in normal powdered tragacanth. |
|---|---|---|---|---|---|
| *1.* | 8.0 | 13.0 | 1.16 | 1.60 | 0.65 |
| *2.* | 10.8 | 13.3 | 1.24 | 1.63 | 0.79 |
| *3.* | 8.9 | 13.8 | 1.33 | 1.60 | 0.60 |
| *4.* | 12.8 | 14.0 | 1.10 | 1.40 | 0.70 |
| *5.* | 8.8 | 11.5 | 1.08 | 1.52 | 0.48 |
| *6.* | 13.0 | 14.9 | 1.44 | 1.33 | 0.60 |

A development of acidity takes place when tragacanth is deprived of its moisture and a further increase in acidity occurs upon heating the powdered tragacanth at 100° C. This fact not only indicates a physical change, but a chemical change as well, when tragacanth is subjected to heat.

SUMMARY.

1. In the preparation of mucilage of tragacanth, one- and two-minute boiling periods produce an initial maximum viscosity, which increases greatly upon aging.

2. Mucilage made by subjection to three-minute boiling period produces a mucilage of high viscosity, yet aging does not materially effect a change in viscosity.

3. Prolonged boiling decreases the viscosity of the mucilage to a great degree.

4. Heat has a deleterious effect on powdered tragacanth.

5. Loss of moisture seriously impairs the powdered gum.

6. A chemical change occurs when powdered tragacanth is subjected to heat. The investigation is being continued.

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## REMINISCENCES OF EARLY PHARMACY IN BALTIMORE.

DAVID M. R. CULBRETH, M.D.

Fifty years ago when I was graduated from the Maryland College of Pharmacy several of the older reputable druggists of Baltimore, acquainted with my creditable student record, were concerned sufficiently to seek and offer positions in their stores, a fact convincing me even then that college standing, like virtue, has its reward. However, being satisfied with the clerkship already held for a couple of years, at Laroque's, 20 W. Baltimore St. (old number), which granted the privilege of assisting Professor Simon at the College, it was believed best not to make a change until I was considered equal to assuming business on my own account—that which was the ultimate aim for a suitable living revenue.

On entering the institution, autumn of 1877, I found many echoes of that

year's graduating class still lingering, especially in the minds of a few left-overs ever anxious to impress their own wisdom upon the fancied unsophisticated newer matriculant, but soon concluded that none enjoyed more unstinted praise than the highest honor man, Henry P. Hynson, who later was to attain deservedly much pharmaceutic distinction, and then gave the surprise—of intending to clerk indefinitely in the drug store of Charles R. Pue, Baltimore and Stricker Sts., where he already had acquired much valuable experience. Months quickly glided by until the end of my first session when a new crop of graduates, class of 1878, came into view. As the entire student body in those days attended together all lectures (each year's course being simply a repetition of the other) unrestricted opportunity was given for intermingling and forming friendships irrespective of class identity which made it easy for one of discernment to assign aright individual appraisement. Consequently, of that graduating class I recall two strikingly matured manly characters: Charles H. Riley, the highest honor man, who, after exceptional theoretical and practical training at Andrews and Thompson's well-known pharmacy, Baltimore St., determined to follow the foot-steps of his father (already an esteemed Baltimore physician) by entering the field of medicine, in which, after extensive study at home and abroad, he became a distinguished practitioner of his native city, where even greater heights would have been attained had he enjoyed a longer life; the other, J. Mason Hundley, who, after a long service in the popular pharmacy of N. Hynson Jennings, 90 N. Charles St., where he became thoroughly familiar with pharmaceutic theory and practice, also entered medicine, to which he gave years in mastering its application and technique, only to become early in his career Professor of Gynecology in the University of Maryland, where he continued until his very recent death, November 3, 1928, to discharge duty with marked ability and success.

Throughout the college course I heard much of Baltimore's so-called "fathers of pharmacy," viewed with strong interest portraits of the few that graced the library walls, and examined occasional collections of books donated by one or another in the remote or recent past. But it was not until after graduation, which brought temporary relief from intensive study, that my direct duties permitted calling on and visiting some of those occupying this eminent domain. To me there always has been a kind of halo surrounding men who, like stately oaks, have lived long in spite of numerous devastating storms—just as has the man of success in pharmacy, or in anything, made a direct appeal through the occult or mysterious route often encountered in the pursuit. So to my then youthful eyes all such seemed masters of the way they trod, real giants, who in making their lives stand for something had made something upon which to stand, the veritable *sine qua non* of existence from the viewpoint of the ambitious young and not infrequently of experienced elders. It was therefore little wonder that I was interested in these fathers who had struggled so persistently to uplift themselves as well as their calling and now had reached, or were nearing, the passing over to others of their partly finished task.

It came to pass that the '80's found me in business, a conservative competitor, whereby many of these gentlemen were to be met on intimate terms and together counsel taken through organizations and otherwise in solving a few of the many then perplexing problems. Some were seen at the regular monthly college meetings, others at places of business or homes, when the hour spent seemed never amiss,

as the visitor and visited felt amply satisfied with the non-frothy mixture served—of old and new. Indeed, they recited, now and then, memories of even an earlier generation, including individuals, lost save in acts and deeds, that had meant so much for local betterment of the pharmaceutic art, for that it merely was then, so little science being involved.

It was a pleasure for some of them to remind you that: Baltimore was just 150 years old, having been laid out and incorporated in 1730, when it had scarcely a dozen houses and a hundred souls, but an abundance of iron ore from which in the beginning it received the chief impetus in trade and population; that its first drug store was established by Dr. William Lyon, 1746, at Baltimore and Calvert Sts., and its second by Dr. John Boyd, twenty years later, 1767, even though in those two decades the town had increased to 350 houses, 3500 inhabitants, and 10 physicians; that virtually there were no druggists then, nor need of drug stores—these, so-called, being run by doctors in connection with their practice, and having an apologetic armamentarium—few chemicals, galenicals, Indian remedies (plant-roots, barks, etc.), dye stuffs and sick-room supplies, but no sundries or proprietary nostrums—the first of these, in America, being "Antibilious Pills," patented in 1796, only to be followed by legions shortly thereafter. On the other hand there was much sickness as evidenced by the *pro rata* of physicians, who were kept continually busy treating common ailments as well as frequent prolonged epidemics of bilious, remittent, scarlet, spotted, typhus, yellow fevers, small-pox, cholera, dysentery, measles, mumps, etc., through the intervention of bleeding, cupping, rubbing, vaccination, iron, calomel, blue mass, blue ointment, ipecac, tonics, cinchona and dogwood infusions, etc.

But as a fact, in their conversations nothing ever eclipsed in interest and significance their account of the early contribution to pharmacy by several families of French refugees, who, along with 1000 whites and 500 blacks, escaping the San Domingo massacre of 1793, sought and accepted Baltimore as a haven of safety. Napoleon after receiving his lieutenancy, 1785, did not hold in abeyance for long his mighty ambition towards war and conquest, causing all France to be apprehensive, and many, in and out of the army, to venture "Hands across the Sea" to sympathetic and democratic America. Some simply escaped to the French colonies, San Domingo, etc., only later, when encountering revolutions and massacres, such as that of 1793, to be compelled, wherever possible, to seek our own more peaceful land. Such a sudden influx here of foreigners—of which our other important seaports, Philadelphia, New York, Boston, shared similar experience—was soon assimilated in various lines of trade and art, which reflected at once a visible touch of excellence and superiority.

*Edme* (*Edmund*) *Ducatel.*—Of the San Domingo refugees of 1793, this young man happened to be a well-trained pharmacist, for he had enjoyed several years at the École de Paris and an equal period in a drug store where chemicals were prepared and prescriptions compounded *a la mode*, and fortunately had sufficient means to establish himself in business. This he did in 1796, as chemist and druggist, at 26 W. Baltimore St., third door west of Harrison, where, through adherence to scientific methods and ethical practices, he held for 40 years the unabated confidence of physicians and patrons, thereby giving to pharmacy in our city its true birth, he being its real father. By admitting a son as partner, 1818, the firm's name be-

came: "Edme Ducatel and Son," and shortly thereafter a second son, Jules Timoleon (1796–1849) made it "Edme Ducatel and Sons." However, the latter with a scientific bent, finding store duties uncongenial, hastened to the University of Paris to specialize in chemistry, geology, physics, botany and after a stay of six years returned to our city, only to be sought by institutions of learning and to become Professor of Chemistry and Geology in the University of Maryland, which he served many years with satisfaction and distinction, dying at the age of 52, his father having preceded him by some years, as had also the most reputable business (1834). Edme Ducatel was of small stature, dark complexion, quick in movement and speech (French), and usually was observed with some sort of flower between his lips, so that in the interruption by trade of its analysis, moisture could be supplied. He was an experienced botanist—a man most helpful to the sons of fellow refugees and to many other deserving young men who sought positions in his store, only later to become physicians or self-established pharmacists that brought professional and commercial dignity to their several communities.

In my research I find this reference (1859) by Dr. William S. Love, a highly respected physician of our city in the long ago. "In the year 1826, the late Robert Oliver, Esq., of Baltimore, called at the drug store of the late Edme Ducatel and Son (in which establishment I was an assistant), requesting a plaster for his back, suffering severely from rheumatism. I prepared one which gave prompt and lasting relief. Sometime, subsequently, Mr. Oliver called to thank me and tendered five dollars, which was refused, but gave permission to use his name in connection with the plaster."

Hyppolite Ducatel, the last male member of the family, passed away in 1857, while two sisters, Joanna and Polymnia, survived beyond—one until 1875.

*John Michel Laroque* (1788–1864).—When the Laroque family escaped the San Domingo insurrection and reached Baltimore, 1793, this then child, was rounding out his fifth year. After knowing his French and going through our city parochial schools with a fair knowledge of English, always spoken with accent, he was accepted in Ducatel's store, where he remained some years, becoming thoroughly equipped in the science and art of pharmacy. In 1817 he established his own business, at 20 W. Baltimore St., 3rd door east of Ducatel's, and at once entered largely, much to the disapproval of physicians, into the manufacture of proprietary medicines: Antibilious Bitters, Antibilious Pills, Elixir of Calisaya Bark, Florida Water, Salves, etc.,—remedies that seemed needed by those of mediocre means. Two years later, 1819, the firm became "Laroque & Milhau" and continued until 1827, when, by the retirement of Mr. Milhau, it reverted to the original. Mr. Laroque was of short stature, somewhat heavy set, dark complexion, smooth face with the eccentricity of wearing his "stove-pipe" hat—behind as well as in front of the counter. His son, (John Phillip) Êmile, 1820–1871, succeeded to the business, which after his death, owing to the minority of the sons, Êmile and Regis, passed into hands of strangers, and after the fire, 1904, out of existence.

*John F. Milhau* (1796–1874).—This family also was among the San Domingo refugees that reached Baltimore in 1793—the father having been born in France, 1762. This son was born in Baltimore, 1796, and, after elementary training in parochial and city schools was sent to Emmittsburg Seminary, from where he entered Ducatel's Drug Store for several years—until the death of his father and

the needs of the mother enforced a revenue beyond that of a clerkship. He established himself, 1816, at 3 W. Baltimore St., which was abandoned two years later in order to become partner of Mr. Laroque, under the name, "Laroque and Milhau," which continued until 1827, when Mr. Milhau withdrew and moved to New York, where, after several years of foreign study and travel, he established a business, Broadway and Maiden Lane, much after lines of his former Baltimore connection, and in due time acquired an enviable name and trade. Mr. Milhau was of the larger type Frenchman, roundish face, dark complexion, beard and moustache, with genial, courtly manners. He married Miss Guillau, Philadelphia, 1828, daugher of one of the original French refugee families which settled in that city.

*Nicholas Monsarrat.*—This gentleman, a refugee of 1793, after equipping himself at Ducatel's as a druggist, became apothecary, 1819, to the Baltimore General Dispensary, a position retained for several years—until the establishment of his own business, 1827, on W. Baltimore St. (58; 150; 142; 174), near Light, thereby at that early period serving the locality that later fell into the hands of Messrs. Coleman & Rogers. Only fragmentary data remain of his career—chiefly the evidence of his cousin, Oscar Monsarrat, who was literally brought up in that store under very rigid discipline and exacting methods.

*Oscar Monsarrat* (1813–1887).—This gentleman the writer remembers very distinctly, having visited him several times at his store, 113 S. Broadway, where he was always so pleased to meet friends. Having lost his father, a sea-captain, when 14 years of age, he shortly thereafter took a position in his cousin's store, only to spend continuously the remainder of his life, 60 years, in the retail drug business. He was of moderate stature, with dark complexion, hair and moustache, taciturn, easy manners. Some documents also spell the name—Monsurat and Monsurratt. His store was most unpretentious—simply drugs, without the slightest innovation of side-lines.

*Elias Durand* (1793–1873).—This gentleman was a native of France, who, after serving in her army under Napoleon, emigrated to this country, locating at first in New York, then Philadelphia, next Baltimore and finally Philadelphia where he lived and died, after conducting a retail drug store for many years. While in Baltimore, in his early try-out of cities for final selection, he was employed at Ducatel's—then in the eyes of Frenchmen, in fact, many other citizens—the only real drug store here. He was not only a fine chemist, but an unusual botanist; he devoted much time and study to botany, especially to the classification of indiginous plants. He was, at one period, a Vice-President of the Philadelphia College of Pharmacy and contributed many monographs to the *American Journal of Pharmacy*.

Irrespective of the border city chosen, many of these French refugees knew, visited and maintained a sympathetic interest in one another. All were Catholics—plain, capable, industrious, living within their lingual circle, and seldom marrying into other blood. They visited Europe occasionally, also friends in neighboring cities, but their lives meant a service to business, family and religion. Durand, Laroque and Milhau were names highly respected in France, as members of each had filled, with credit, public positions of honor and trust. Even though these Frenchmen once largely influenced pharmacy in our city, only one family—Laroque—survives to this fourth generation, one member being a prosperous druggist in

a choice residential section, and another a popular physician with family—two sons to perpetuate the name.

Another whose praise these fathers sounded continually, a native product, was Mr. George W. Andrews (1801–1877), who established himself, 1829, at 3 W. Baltimore St., but after 1842 at next door, West, No. 5, diagonally across from Laroque's, stressing the facts: "English and French chemicals, fresh and choice; test-reagents prepared to order; drugs and medicines, etc." He soon became a chemist of repute as well as a prescriptionist who enjoyed the implicit confidence of physicians and the public. Years later, 1857, he associated with him, as partner, his able and long time (18 years) trusted clerk, William Silver Thompson (1822–1894), thereby creating the highly respected firm of "Andrews and Thompson," which survived until recent years. Both men were of sound education with scientific trend, resourceful, accurate, reliable—Andrews becoming author of many technical monographs, President of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1856, member of the Maryland Academy of Science for 55 years, a foremost spirit in founding the Maryland College of Pharmacy (1841), and its efficient initial president, which continued until his death; and Thompson—one of the three in its first graduating class, 1842, and later, editor of *The College Journal and Transactions*, 1858–1862, as well as author of valuable chemical and pharmaceutical literature, and who lived to round out 56 years in the one establishment. Another store of this early period was that founded (1824) by Mr. Thomas G. Mackenzie (1802–1873), N. E. Cor. Baltimore and Gay Sts. After a year the firm's name was changed to "Thomas G. Mackenzie and Co.," and in 1827, at the death of his father, Dr. Colin Mackenzie (1775–1827), to "Mackenzie and Co.," inasmuch as his two brothers, prominent physicians with a following, had a monetary interest. Mr. Mackenzie's educational and social advantage inferred high business ideals, and, as a fact, he always stressed the best in pharmacy, consequently, when in the late thirties (18–) a college to teach its underlying principles was agitated, few worked until its accomplishment with greater loyalty and zeal.

Just beyond that corner, on the west side of Gay St., No. 44, slightly north of Fayette St., was the store of Charles C. Caspari (1815–1871), father of the late Prof. Charles C. Caspari, Jr. (1849–1917), where the latter was born and literally breathed from infancy to manhood a wholesome pharmaceutic atmosphere, as the father, a Ph.D. of Göttingen, in spite of scant English, and that with a decided accent, was highly educated in languages and sciences, well-trained in chemical theory and manipulation, a ready translator and contributor of foreign articles, and a helpful worker in the College of Pharmacy.

At my advent in Baltimore, 1877, all of these early pharmacists, except Thompson and Monsarrat, had gone to their last reward, but their places of business, save Ducatel's, were active under younger management. Baltimore Street still was considered the main retail artery along which was dotted, practically in every block from Caroline to Stricker Sts., a thrifty drug store. Especially were they found, sometimes in pairs, in proximity to the markets, where outlying patrons, even the purveyors themselves, could obtain easily, on stated days, both drug and food supplies. It was not until the '40's that stores began to follow sources of trade by locating on parallel and lateral streets—Fayette, Franklin, Lexington, Saratoga, Pratt, Broadway, Gay, Charles, Howard, Eutaw, Greene, Pennsylvania Ave., etc.,

in order that residential sections might be accommodated all the easier—an innovation that necessarily proved detrimental to some of the Baltimore Street stores.

The first two real elders of pharmacy that impressed me forcibly were Dr. Elisha H. Perkins (1812–1888) and Seth S. Hance (1817–1884), both then about beginning to enjoy the fruits of their labor—in retirement. Each of these gentlemen on the street might readily have occasioned more than passing notice, dressed in conventional black, with stock and silk hat, that of Dr. Perkins being of modern style, that of Mr. Hance having vertical sides and flat brim, he being a Quaker, severely plain, and using consistently *thee* and *thou* in all conversation. His store, 1845–1904, on the north side of Baltimore St., No. 108, between North and Holliday, opposite "The Sun" iron building (the name usually given it then) was a veritable emporium of his own and other proprietary remedies—patent medicines, where most everything in quantity could be found in that line with which the retailer might be supplied at a divided profit. It was, however, a well-equipped drug store without the prescription counter, towards which the trade maintained a friendly attitude and the public a liberal spirit. I went there frequently during clerkship days and although he was usually around, the service was in the hands of his son, Frank, and other skilled assistants. On one occasion while waiting for a package he casually remarked, "I so often used to hear Andrews (Andrews and Thompson—with whom I served my apprenticeship) say, when I can do a business equal to Laroque's I will be satisfied."

Dr. Perkins still continued to frequent his store, 1845–1884, N. W. Cor. Baltimore and Greene Sts., where he gladly welcomed friends, but took little part in the service, that being under the direction of William H. Osborn (1835–1881), a wide-awake genial gentleman, popular with both patrons and physicians, and then also Vice-President of the College.

The real active elders of that period, about thirty, may be of interest along with the year each assumed business on his own account—all prior to the Civil War, but continuing through it and into my day and generation: Oscar Monsarrat, '35; J. Brown Baxley, '36; Seth S. Hance, '45; Elisha H. Perkins, '45; James C. Rogers, '45; J. Van Dyke Stewart, '45; John J. Thomsen, '45; William Caspari, '49; Edwin Eareckson, '49; Alpheus P. Sharp, '49; J. Faris Moore, '51; N. Hynson Jennings, '55; Joseph Roberts, '55; Richard Sappington, '55; J. Jacob Smith, '56; William Silver Thompson, '56; John F. Hancock, '57; Louis Dohme, '58; Charles E. Dohme, '60; Henry A. Elliott, '60; Columbus V. Emich, '60; James P. Frames, '60; Adam J. Gosman, '60; Ferdinand Hassencamp, '60; M. Joseph Muth, '60; E. Walton Russell, '60.

They all held membership in the College for which the annual dues, five dollars, went a slight way towards institutional support. I met and talked with them in and out of season so long as they lived but of only three—M. Joseph Muth, Alpheus P. Sharp and J. Brown Baxley—have I preserved accounts pertaining to their early experiences in the drug business. These were written after personal interviews by appointment and submitted later to each for possible correction, so that they constitute virtually their own statements under affidavit. But these must constitute another article.

# DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

## COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

## ERNEST HAMPTON SAVES $1200 IN BUYING A SODA FOUNTAIN.

In these days of the purchase on the installment plan of everything from suits of clothes to 30-room mansions, the man who buys for cash anything which runs into any money at all is the object of much curiosity. At least, that is the way it seemed to Ernest Hampton, progressive druggist.

His new store had been open now for more than two months. Every day he received from his customers and friends in the trade enthusiastic congratulations upon the appearance of his new store and the volume of business that it was quite evident he was doing.

"You mean you paid cash for that fountain," exclaimed Ed Garrity, genial wholesaler's salesman, in incredulous amazement to Mr. Hampton. "I'll bet that soda fountain salesman had the thrill of his life!"

"Well, he did say this was the first fountain he had ever sold for cash in his twenty years in the business," admitted Mr. Hampton.

"I thought so. Pretty soft for you, Ernest. Fountain and fixtures all paid for, a growing business and nothing but the ordinary running expenses to be met out of the day's receipts.

"You know what breaks a lot of these fellows in starting a new business is not that they don't buy right or do enough business. Their stores are perfectly able to meet ordinary running expenses and leave them at least a small profit. The trouble is that they start with so little cash capital that they have to buy most of their necessary equipment on the installment plan. This means that during those first few trying years in business they are loaded down with a series of monthly payments which, in the aggregate, amount to quite a sum.

"There is only one place from which the money can come to meet these payments. That is from the money the business earns after ordinary running expenses and merchandise bills are paid. If the business doesn't earn enough profits to meet these payments—and it often doesn't when it is first starting—it is easy to see that that proprietor is headed for trouble and mighty serious trouble it is.

"I guess you thank your lucky stars, Ernest, that you don't have to worry about monthly payments on equipment while you are getting this business on its feet."

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* Instructor of merchandising, Wharton School of Finance and Commerce, University of Pennsylvania, Lecturer on Business Administration, Philadelphia College of Pharmacy and Science.

"But I do have my monthly payments to meet," calmly replied Mr. Hampton.

"You—what? I thought you told me you were the only man to whom that salesman ever sold a soda fountain for cash."

"That's right, but where do you suppose I got the money to pay cash for this fountain and where do you suppose I am going to get the cash to pay for another fountain when this one is worn out?

"Let me show you something. I figure that a new fountain should last me twelve years. It is iceless throughout and maybe I am underestimating its life, but I'd rather underestimate than overestimate.

"It cost me with all equipment just $3600. In twelve years I'll need to replace it. If I don't have $3600 in cash, then the only way I can make this necessary replacement is to buy a new fountain on the installment plan, and let it pay for itself out of its earnings.

"Now here is my plan to have this $3600 in cash in twelve years. To save that $3600 over a period of twelve years looks as if it required a yearly saving of $300, or $25 a month. Twenty-five dollars a month, however, is much more than it is necessary to save to produce the required $3600 in twelve years. The magic of compound interest does the trick. It makes the money I save now earn me more money. I went to Mr. Bramble at the savings bank and his tables showed that if I deposited $19.50 a month, in my savings account with them, it, with the 4 per cent interest which they compound monthly, would amount to just $3600 in twelve years. Now figure out what I save.

"Payments of $19.50 a month for twelve years make a total of $2808. That is to say, by saving $2808 at the rate of $19.50 a month, I'll accumulate enough at the end of twelve years to buy for cash a new soda fountain which costs $3600. There is a saving right there of nearly $800, leaving aside any question of the cash discount I might receive when I do buy a new fountain. That isn't the whole story, however. Suppose I don't save this $19.50 a month. I am going to need a new fountain regardless of whether or not I save, in advance, the money to pay for it. What will it cost me if I don't save in advance?

| | |
|---|---|
| First, a down payment of, say 10% | $ 360.00 |
| Second, monthly installments of $67.50 on the balance, spread over a period of 4 years | 3240.00 |
| Third, interest at 6% on the unpaid amount of monthly installments, a total of | 388.80 |
| | $3988.80 |

"Now don't misunderstand me, Ed. Far be it from me to criticize the installment plan. It is the salvation of many people. It enables people to possess merchandise long before they otherwise would be able to obtain it. It forces people to save who, if it weren't for the compelling necessity to meet installment payments on merchandise already in use, probably never would be able to save a cent. In other words the effect of the installment plan is to greatly increase the consumption and therefore the sales of much useful and valuable merchandise.

"My figuring has to do only with the conduct of a retail drug store. I say simply it is inevitable that after a period of years the equipment used in the conduct of a drug store will have to be replaced. Any experienced druggist can estimate

with fair accuracy for each item of equipment what that period of years is going to be.

"As long as this replacement is inevitable, it seemed to me the only sensible thing to do would be to try to figure how it could be replaced at the least expense. You see the result. The fountain which some day will have to replace this one is going to cost me in actual cash layout only $2808. If I waited until I had it in the store before I commenced to pay for it, it would cost me, according to my figures, $3988.80, almost $1200 more. In order to make this saving of nearly $1200 all I have to do is to set aside $19.50 a month of money that eventually I'd have to spend anyway. That certainly is little enough, don't you think, considering the saving it makes possible?"

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## GRADUATE EDUCATION IN PHARMACY.*

BY G. L. JENKINS.[1]

Educational standards in pharmacy have advanced rapidly during the past five years when compared with previous periods, but this advancement has not been rapid if compared with the extension of such standards in other professions. The expansion of graduate pharmaceutical education, although marked, has especially failed to keep pace with that in other allied sciences. The reason for this condition is probably due in part to the assumption that the training of retail clerks and pharmacists is the primary and, frequently, the only function of our colleges. It is also caused in part by the fact that the majority of our schools, as well as the men who guide pharmaceutical education, have not been in a position to give more than the usual elementary stages of academic work designed to prepare retail pharmacists.

Until a century ago pharmacists were pioneers in research not only in their profession but ofttimes in that of the allied sciences. With the growth of other sciences—some of which were foster children of pharmacy, although they do not admit it to-day—pharmacy has receded into the background. Consequently, when we look for the achievements of pharmacists among the recent notable researches in the synthesis of new medicinal agents, in the development of biologicals, in the systematic analysis of drugs, in the study of vitamins, or in the knowledge of glandular products, we find that this work has mostly been accomplished by members of other professions that expanded into these fields which properly belong to pharmacy, and not by pharmacists. Much of this work has been done in pharmaceutical establishments but, usually, by others than pharmacists.

It is usually granted that much of the work requiring precise technical education and experience has disappeared from even the most professional of our modern dispensing pharmacies and has found its way into manufacturing plants. As a result, the technical educational requirement necessary for the retail pharmacist has decreased while that of the manufacturer has increased. Little cognizance has been given on the part of our schools to the need of preparing men to take their place in and make such plants truly pharmaceutical. Many manufacturers have few pharmacists on their scientific staff, while chemists, medical men and pharma-

* Section on Education and Legislation, A. PH. A., Portland meeting, 1928.

[1] Professor of Pharmaceutical Chemistry, University of Maryland, School of Pharmacy.

cologists are employed in considerable number. Obviously, a demand exists for men who have completed graduate education in pharmacy to do research in manufacturing pharmacies.

The recommendation of the Association of Colleges of Pharmacy that all schools encourage research indicates a hopeful trend. Definite steps in this direction may be expected in the near future. Further progress is indicated by the requirement of the Association that member colleges appoint only persons to positions above the rank of instructor who hold graduate degrees. With the steady increase of undergraduate educational standards this requirement is not too high. Our schools of pharmacy must give graduate work in order to prepare qualified teachers and research workers in considerable number, if we are to make the advance in general educational standards more than a gesture.

Graduate education in schools of pharmacy has grown slowly during the past few years and needs much further development. In 1927 nine schools offered a standard academic "master of science" degree and four the degree of "doctor of philosophy." Three schools offered the degree of "master of science in pharmacy" and three that of "doctor of pharmacy." In some cases the "doctor of pharmacy" degree is given for two years of graduate work. Thirteen different institutions or approximately twenty-five per cent of our recognized colleges offered graduate degrees. The fact that some of these schools have practically no graduate students indicates that the opportunities in pharmaceutical research and teaching have not been stressed. This is further emphasized by the exceedingly low ratio of graduate to undergraduate students in pharmacy as compared with other sciences. It is found that the majority of graduate students take their work in colleges offering the doctorate degree. It is also found that the greater number of grants from industrial plants are placed in such colleges.

The Association of Colleges of Pharmacy has provided that our schools may give the "master of science in pharmacy" and the "doctor of pharmacy" degrees for one and three years, respectively, of graduate academic work beyond the bachelor's degree. Since the majority of our colleges giving graduate work are granting standard "master of science" and "doctor of philosophy" degrees, it is desirable that such degrees be adopted. This would create needed uniformity in graduate pharmacy degrees and place them on a parity with degrees offered in other sciences by all universities,

Although progress has been and is being made, much remains to be accomplished. More schools should institute graduate work so that pharmacy will be represented by a group of scientists equipped to do pioneer research work. Qualified undergraduate students should be encouraged to continue beyond the bachelor's degree. The united support of pharmaceutical manufacturers through establishment of research fellowships should be secured, as in the chemical industries.

When graduate work of a high standard becomes established in a majority of our properly equipped colleges, pharmacy will no longer be discriminated against in governmental appointments; research grants from our industries which now are placed in other schools will be given to pharmacy. The prestige of pharmacy will be greatly increased through professional achievements. Most important, pharmacy will produce in its ranks a group of men capable of extending and consolidating its fields of activity.

# PROFESSORS OF PHARMACY.*

BY WORTLEY F. RUDD.

In medical schools the professor of medicine is regarded, I believe, as the most important single person on the teaching staff. Most of us will agree that the professor of pharmacy probably bears a similar relation to schools of pharmacy.

With this in mind I have attempted to collect some data about the men holding these positions in our schools. In this very brief paper I have tabulated my findings, made certain comments and drawn a few conclusions that may or may not be warranted, depending, of course, upon the point of view of the individual reading them.

The following letter and questions were sent to all the pharmacy deans in this country and Canada, as listed in the report of the New York Educational Department, some sixty odd:

June 18, 1928.

TO THE DEAN:

I am preparing a paper for the A. PH. A. meeting on "Professors of Pharmacy." Of course the finished paper will deal with the subject in an entirely impersonal way, but I believe a genuinely interesting and helpful contribution may be made if the dean will supply certain data which will be held strictly confidential, of course, the summaries alone to be published and no names either of colleges or men will appear.

This is just one more questionnaire. I could get some of the information needed from your catalogue but it is not complete enough for my purposes. Please have your secretary mail me a copy of your catalogue for 1928–29 along with this sheet, as this will also be needed.

Hoping to see you at Portland in August and with regards, I am

Very truly,
(Signed) WORTLEY F. RUDD, *Dean*,
School of Pharmacy,
Medical College of Virginia.

1. School of.....
2. Name and age of each teacher in department of pharmacy having rank of Professor, Associate Professor and Assistant Professor.....
3. Academic training: Where received and degrees.....
4. Professional training: Where received and degrees.....
5. Honorary degrees: When conferred and by what institutions.....
6. Approximate clock hours of teaching per week—Session 1928–29–Didactic–Laboratory Total.....
7. Yearly salary of each. (Some schools may object to this item—then omit.).....
8. Contributions to the literature of Pharmacy:
   (*a*) Strictly scientific paper, No.....
   (*b*) Of professional nature, No.....
   (*c*) Books, titles of each.....
9. Administrative office in the school held by Professor of Pharmacy.....

Information has been received from forty schools. Not all of them answered all of the questions. We believe, though, that the answers received represent a fair cross-section.

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* Section on Education and Legislation, A. PH. A., Portland meeting, 1928.

The average age of full professors reporting is forty-seven, the oldest being seventy-one and the youngest twenty-six. Three are more than sixty, six between fifty and sixty. Among associate professors reporting the average age is forty-one, none over sixty and only one over fifty. Among the assistant professors the average age is thirty, there being only one over forty.

The average then of the full professors is on the upper limit of their prime as teachers. The average of associate professors well within the prime of usefulness, and the assistant professors at thirty, just well on the way.

Some interesting facts have come from Question 2 headed "Academic training." Among the full professors reporting, thirty-six in number, twelve have a bachelor's degree, seven a master's, four a Ph.D., two are M.D.'s, and one an honorary M.A. Among the associate professors reporting, nine of them, one has the bachelor's, five the master's and three the Ph.D. degree. And among the assistant professors, fourteen of them, six are bachelor's, seven are master's and one a Ph.D. It will be noted that all men reporting in both of these latter groups have at least a bachelor's degree.

In the question about *clock hours per week* actually given to instruction, we have a range from a minimum of two hours among full professors to a maximum of thirty-five, and an average of 14.9; among associate professors a minimum of ten to a maximum of thirty-five, and an average of 15.7; and in the assistant professors' group a minimum of twelve, a maximum of thirty-five, and an average of 17.6 per week.

Information in reply to the question about salaries was given much more freely than we expected it would be. Among twenty-nine full professors reporting, we have a maximum of $6000, a minimum of $2000 for full time and an average of $3948. Four are $5000 or more, sixteen from $4000 to $5000. It is interesting but also pathetic to note that the man receiving $2000 for full time has thirty-five hours' teaching per week.

Among associate professors the range is minimum $1200, maximum $4000, and an average of $2883, and among assistant professors a maximum of $3300, a minimum of $2000, and an average of $2637. Since sixteen of the twenty-nine full professors reporting on salary schedules are also acting in capacity of dean, it is fair to assume that a part of the salary paid men acting in such dual capacity may properly be charged to administration.

Naturally data in the above paragraph have a far greater human interest than any other in this paper. Just as the paragraph was being written a fellow teacher, the head of a large department in another institution, came in for a loan and when we had to confess to him that we could not help him out he said, "Teachers are always broke." Is this the teacher's fault or the fault of the salary? "*Quot homines, tot sententiae.*"

The answers to the 8th question on contributions to the literature of pharmacy, etc., were very unsatisfactory. Out of seventeen reporting on scientific articles, the number published ranged from one to "too many to be enumerated," or "it would take a week to collect this data." I fear the word "scientific" may have been used a bit loosely. Only seven textbooks were reported. Many papers of a professional nature were reported though fewer of them than of a scientific nature. We must record with deep regret that many of our schools reported no sort of

scientific or professional contributions from their teachers occupying these most important positions.

Now for a few general observations. In the first place our questionnaire asked for data on "Professors of Pharmacy." Many schools sent page after page of data about all the men in their universities, chemists and everybody else. The fault must have been with the question itself. It frequently is this way.

In two of the good schools of the country the highest rank accorded anyone teaching "pharmacy" is that of associate professor. This raises an interesting speculation. Are these institutions unwilling to grant full professorships to pharmacy teachers or is it that the men are not well enough trained and long enough in service to rank as full professors?

I cannot close without making a suggestion. The basis for it comes out of some ten years of experience as the administrative officer of a small school of pharmacy. Who are to be our professors of pharmacy in the next generation? What provision is being made for training broadly men to take up this work? A few of our universities are prepared to give men honest-to-goodness training leading to a Ph.D. in pharmacy, but a very few. I have felt for some time that since the field of chemistry is becoming so crowded, it would be a fine thing if our best universities that have well-organized departments of pharmacy would plan with their graduate departments of chemistry to have a few of the former's graduate students take all of the work given under the chair of pharmacy as a first major for their doctorate.

This would serve two good purposes, first, relieve some of the congestion among those now flooding the field as applicants for teaching positions in chemistry at pitifully low salaries, and second, bring into "pharmacy" a group of finely trained young men with a real scientific background fitted to give good service as professors of pharmacy at salaries that are better than the average in chemistry.

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## INSPECTION OF MANUFACTURING PLANTS.

The advisory committee of the Federal Narcotics Control Board has been engaged in a tour of inspection of plants manufacturing narcotic preparations. The committee is composed of L. G. Mutt, secretary of the board and representative of the Department of the Treasury; John K. Caldwell, of the Department of State; and C. C. Concannon, of the Department of Commerce. This inspection is giving the officials first-hand knowledge of the problems and process of the plants holding permits under the Federal narcotic laws.

## VIEWS EXPRESSED BY THE COMMISSION ON MEDICAL EDUCATION.

In the third report of the Commission on Medical Education this body urges broader latitude for entrance requirements to medical schools, holding that specific medical school requirements should be confined to the fundamentals of biology, physics and chemistry. Among the most common criticisms are those that have to do with the overcrowding of the curriculum, and a failure to correlate properly the work of various departments with clinical practice.

The Committee also holds that state medical boards and other agencies concerned with licensure could help materially to correct present defects in medical training if they would confine their functions to the approval of medical schools and the general features of medical training and internship, and leave the details of the curriculum and clinical training to the medical school authorities.

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The California State Medical Board recently revoked four licenses—the reasons assigned are habitual intemperance, illegal operation and narcotic addiction.

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

## THE TEACHING OF PHYSIOLOGY IN THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF TENNESSEE AT MEMPHIS.

BY A. RICHARD BLISS, JR.*

When, years hence, the pedagogical archæologists of pharmaceutical education excavate the moldy caves where pharmaceutical educators exist and labor, they will find an accumulation of centuries which they will call the anatomic stratum and immediately above this layer they will discover a gradually changing stratum which they will term the physiologic stratum. Among the debris will be found the cadavers of discarded teaching methods, the mummies of forsaken hypotheses, the skeletons of abandoned theories, and your bones and mine, fellow teachers.

Someone has said that the present is the era of function. Physiology, in spite of its slender time-allotment in the Syllabus, is the pharmaceutical curriculum. Physiology is pharmacy. If you are in doubt, ask the teacher of Materia Medica and Pharmacology who defines at least a portion of his subject in terms of the action of drugs. Ask the pharmaceutical chemist and the pharmacist who cannot refrain, and this inclination is quite correct and proper, from including in their discussions references to the applications of the materials they handle to the treatment of disease, frequently alluded to as abnormal physiology. Ask the bacteriologist who has adopted the experimental method and is speculating on the "how and why" of the things he handles and the effects they produce on animal or vegetable organisms. Ask the botanist and the pharmacognosist whether these subjects are taught without frequent reference to the physiology of both plant and animal.

All of these jocular exaggerations are but preliminary to the statement that in so far as the teachers of Physiology are able to improve the subject itself and the teaching thereof, to that extent will pharmaceutical education be improved.

*The Teacher of Physiology.*—The teacher of Physiology in a pharmacy school should not be one of those specialists "who knows more and more about less and less." The average M.D. has not mastered physiology. A young M.D. who has completed the regular medical curriculum and who is willing to give a few hours from his practice to teaching does not fulfill the demands of the rôle of the physiology teacher. It is true that we cannot influence the physiologist's heredity; however, we can render some assistance by defining the kind of education the teacher should have. Physiology is the Physics and Chemistry of living matter. Accordingly, Physics, Chemistry and Biology constitute the very foundation of Physiology. His preparation in these subjects should be better than that of the average medical student. Having completed satisfactorily these foundation subjects, he should then master Physiology. In order to accomplish this, the individual must live in the science itself by working in a physiological laboratory under

* Dean of the School of Pharmacy.

the supervision of an enthusiastic, productive physiologist. During this apprenticeship, it is probable that the individual will have learned to teach, will have become familiar with physiological literature and will have published the results of some commendable work. What difference then as to the degrees the individual may write after his name?

In addition to being the possessor of the scientific training already mentioned, the teacher of Physiology should possess the quality of scientific imagination. In Anatomy the student is taught to see with his eyes, to touch with his fingers, to develop his ability to appreciate forms of objects and parts by means of touch, and to exercise muscle sense. He is taught structure and accurate description. His feet are placed on solid ground, for correct observation is the only acceptable basis of correct thinking. Facts are the things our minds conjure with. However, the physiologist must do something more than simply use his sense organs and make true brain connections. More than any other teacher, possibly, he must be capable of seeing with his imagination and touching with his spirit. As Lyon says:

> "He must visualize nerve impulses hurrying in their pathways, hurdling synapses, striking closed passages, seeking open switches, scuttling along collaterals, firing off stored explosives—yea, knocking on the secret and impenetrable walls of consciousness itself. He must see the whirlpool of the blood, the seeping lymph, the trickling secretions, obedient each to the interplay of osmosis, chemical affinity, electric charges, surface tension, gravitation, hydrostatic pressure, all at work in intimate harmony. He must look into the laboring cells, wondrous laboratories, engines, factories. He must see them select and reject, build and tear down, release energy and store it away—work as individuals and yet integrate a human being. All these he must do and yet keep his thinking objective and his philosophy sound. Some boy, the teacher of Physiology! Objectified idealist! Scientific romanticist! Spiritualized materialist! A cross between a butcher and a poet."

In proportion to the ability with which the physiologist is able to visualize processes, see function and feel the struggling life forces, and so far as he is able to arouse in his students scientific imagination, to that extent does he aid in making the pharmacy school a live thing.

The teacher of Physiology should be given freedom and security of tenure. He should be given an adequate salary and his teaching hours should not be unduly conducive to early death. He should be furnished with reasonable assistance, equipment and funds for running expenses. Adequate salaries for assistants should be provided not only because it is their just due, but also because of the fact that from this group must come the future heads of departments.

*The Course in Physiology—Hours.*—Replacement pages 14 and 15 of the 3rd edition of the Pharmaceutical Syllabus assign 60 hours in the first year of the three-year course to Physiology. This represents an increase of 10 hours, or 20% over the allotment of the two-year course.

The experiences of the writer and members of his staff, more particularly during the past five years, have brought the conviction that the 60 hours of the Syllabus are insufficient. At the University of Tennessee the hours were increased from 66 to 99 three years ago, and it has been found that the physiological material brought to light by the Commonwealth Fund Study can be adequately handled in from 90 to 99 hours.

*Place in the Three-Year Course.*—The Syllabus places Physiology in the first year. While it is true that Physics, Chemistry and Biology are desirable prerequisites, and that on this basis some schools have placed the course in Physiology in the second and in the third years, the pharmacy student is involved in physiological references in other subjects of the first year, more especially in his work in Botany. In his courses in Organic Chemistry and Materia Medica (with its sub-divisions) of the second and third years, the student is definitely involved in physiology. It appears, therefore, that the course in Physiology is for the most part rightly placed in the first year.

*Method of Teaching.*—At the University of Tennessee lectures, for the most part informal, charts, lantern slides, the blackboard, the skeleton, models, the cadaver, the living subject, recitations, laboratory demonstrations, the textbook, collateral reading, and the student's notes constitute the oral and visual aids to final results.

*Lectures.*—Some teachers strongly favor lectures, while others believe that they are of little value. It is probable that in each case they are just what the proponents believe. Students usually find lectures of value. Written words may carry authority, but it is the personality in immediate command who "puts it over." One must not forget the important factor of group psychology, for most students find that grinding on a textbook by oneself is a lonesome proposition. The desire to know what the teacher wants the student to know and the marking system are further factors in favor of lectures. Proper lectures constitute one of the greatest aids in stimulating imagination and arousing interest. I often recall the splendid lectures of Doctor Henry Hurd Rusby under whom I had the pleasure and privilege of working for three years. Rusby not only talked, but he thought out loud. His lectures were inspiring, suggestive and exhilarating. Physiology was no cut-and-dried study under Rusby. Instead, his presentation of the subject was resplendent with life, an amazing conjury of facts, theories and hypotheses, challenging every power of the human mind. Let the lectures stay in Physiology for those who can use them, but do not overdo it.

Lectures of the proper sort do not make an exclusive appeal to the ear. At Tennessee a collection of good charts, lantern slides, accurate models, the skeleton, the blackboard and the cadaver (borrowed from the Medical School) are among the aids of visual memories. In addition to the foregoing, students themselves are employed as living models for the surface and regional anatomic portions of the course. Girls in the classes are given this part of the instruction by women members of the anatomic staff of the Medical School.

*Recitations.*—The ratio of recitations to lectures is as 1:2. Recitations, as with most of the lectures, are informal and partake largely of the nature of general discussions and conferences. A written recitation is injected twice a month. Recitations cover the material already discussed during the previous lecture periods.

*Laboratory Demonstrations.*—Demonstrations are still used in lieu of a laboratory course, and, since these are given properly and under conditions which permit each student to see clearly what is going on, it seems that this plan is for the most part satisfactory for the present. The demonstrations should be, so far as possible, quantitative in character. Nerve-muscle demonstrations are given to bring out fundamental principles. The complex functions of conduction, coördination,

sensation and the mysteries of stimulation and response can be understood more readily by the average student with the basis afforded by these demonstrations. A demonstration with varying weights presents a very valuable opening for an interesting discussion of tonus. The effects of repeated stimulation may be made the gateway to the great field of efficiency and fatigue. Demonstrations on mammals have the advantage of student interest and of more direct applicability to human physiology. However, complexity of conditions adds to difficulty of control, and control is the keynote to experimentation. In a multiplicity of happenings it is difficult to focus the student's attention on the essential and useful. The human animal himself is always at hand and available, and should be the center of interest. Frog and mammalian demonstrations should be employed as a means of filling out subjects which are not possible in man.

*Collateral Reading.*—Pharmacy students at Tennessee are assigned carefully selected articles to read, abstract and report on. Each student is given at least two assignments. This plan is followed in the belief that students should learn that there is such a thing as original literature, that they should use the library, that they should know that textbooks are merely compilations and that Physiology is a growing and changing science.

*Purposes of the Physiology Course.*—On page 29 of the 3rd edition of the Syllabus, under the title "Physiology and Hygiene" is found the following:

"Physiology treats of the organic functions in a state of health.

"It is obvious that the introduction of the amount of physiology that is essential to an understanding of the subjects listed herein will strain the possibilities of this part of the course to the utmost. This fact precludes the study of anatomy, as such, which subject is therefore presented only in connection with, and as required for, the teaching of physiology.

"*Introduction and General Considerations.*—It is scarcely practicable to prescribe the details of this portion of the subject, as each teacher is likely to have his own original method of introduction. It is wise, however, to commence with a reference to the amoeba, describing its form and structure, and showing that it possesses all the essential properties of a living being: sensation, voluntary motion, locomotion, digestion, assimilation, disassimilation, growth and reproduction. The cohesion of similar bodies, in masses or colonies, yet each vitally independent, follows; then similar masses with the individuals composing certain parts so modified as to perform certain parts of the work, while losing other powers, which are specially delegated to other individuals of the mass. Each is thus no longer an animal, but a cell, forming a part of the animal body. This leads to the teaching of unicellular and multicellular animals, of tissues, organs and functions, anatomy and physiology and organic systems and opens the way for the main subjects of human physiology, which follow."

On page 167 of "Basic Material for a Pharmaceutical Curriculum" appear the following statements:

"Objectives: *Information.*—The pharmacist needs to possess a knowledge of physiology of such quality and quantity as will enable him to grasp and understand those portions of pharmacodynamics with which he is expected to be familiar, as well as such portions as are necessary to an understanding of other pharmaceutical branches involving physiological information, such as toxicology, hygiene and first aid.

"*Skill.*—The pharmacist should be very familiar with such physiological terms as are needed for a proper understanding of functional pharmacology, as applied to pharmacy.

"*Method.*—The anatomical and physiological terms found in Table XIV were drawn from the study of pharmacology. Since most drugs produce their effects or actions by stimulating, augmenting, decreasing or paralyzing one or more bodily functions of the living organisms, the

physiology necessary to an intelligent consideration and understanding of the pharmacodynamics involved was thus brought out. To the terms thus obtained were added such physiological terms as are needed to intelligently read the National Standard and United States Dispensatories, the First Aid Manual of the U. S. Public Health Service and Hough and Sedgwick's 'Hygiene and Sanitation.'

"All of the physiological data thus obtained were classified anatomically and physiologically as presented below. Since there is no indication that the pharmacist requires anatomy as such for the successful fulfilment of his functions, the anatomical data have been classified with the physiological. It must be borne in mind however, that this list of terms is not submitted as a syllabus or outline of a course in physiology; it represents simply the anatomical and physiological terms derived as indicated above. For convenience and organization they have been assembled according to their anatomical and physiological relationship.

"Although practically every system or apparatus of the human mechanism is represented by the physiological data compiled, there are many terms and topics which do not appear in the data but which are absolutely essential to a proper understanding of the subject of Physiology. The sources of the terms found are indicated by figures which are explained in foot-notes. The terms so indicated represent the purely functional terms as based upon the objectives indicated above. Such additional terms as are needed for their proper understanding must be considered 'connective tissue.' The quantity and quality of such additional material remains a matter for the personal opinion and judgment of the instructor."

The broad purposes of the course in Physiology for the pharmacy student are:

(1) To provide pharmacy students with a knowledge of Physiology of such quality and quantity as will enable them to grasp and to understand those portions of pharmacodynamics, toxicology, public health, hygiene, first aid and other subjects of the pharmaceutical curriculum which involve physiological information.

(2) To aid in training pharmacy students in observation and interpretation.

(3) To assist in familiarizing students with the value of exact experimental methods; the idea of "control."

(4) To assist in creating in the students a critical spirit of reading by turning them to the original literature.

(5) To interest some students in further study and research with the idea of stimulating a certain number to become teachers of Physiology in pharmacy schools.

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## CHICAGO WORLD'S FAIR.

Dr. Max Mason, former president of the University of Chicago, and Dr. William Allen Pusey, former president of the American Medical Association, have been appointed members of the Committee on the Chicago World's Fair. The special committee of which of Dr. Mason and Dr. Pusey are members is to coöperate in the development of the scientific theme of Chicago's centennial celebration. Pharmacy should be properly represented.

## FEW DRUG CONCERNS BREAK THE LAW.

In the annual report of the Department of Agriculture, Director Walker C. Campbell of the Food, Drug and Insecticide Administration states that "observations through more than twenty years of law enforcement have demonstrated convincingly that only an insignificant proportion of the members of the industries concerned deliberately violate the law. Most of them earnestly desire to comply with all reasonable regulations not only on ethical grounds but also because it is the part of good business. Recognizing this the Department has chosen to consider the six laws coming under the direction of this division as corrective rather than punitive and has adopted an advisory-before-the-act attitude of offering constructive suggestions which should enable manufacturers to keep their products in compliance with the law."

# THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

H. M. Lerou, President, Norwich, Conn. J. W. Gayle, Treasurer, Frankfort, Ky. M. N. Ford, Chairman of Executive Committee, Columbus, Ohio. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

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| Alabama | Indiana | Montana | Rhode Island |
| Alaska | Iowa | Nebraska | South Carolina |
| Arizona | Kansas | Nevada | South Dakota |
| Arkansas | Kentucky | New Hampshire | Tennessee |
| Colorado | Louisiana | New Jersey | Texas |
| Connecticut | Maine | New Mexico | Utah |
| Delaware | Maryland | North Carolina | Vermont |
| D. of Columbia | Massachusetts | North Dakota | Virginia |
| Florida | Michigan | Ohio | Washington |
| Georgia | Minnesota | Oklahoma | West Virginia |
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| Illinois | Missouri | Pennsylvania | Wyoming |

## DOES EDUCATION PAY?

BY JOHN CULLEY.*

Various and many attempts have been made in recent years to answer the question, "Does Education Pay?" meaning education acquired in schools and colleges or other institutions of classified learning. It is freely admitted and undeniable that there is a profit in mental superiority and spiritual satisfaction to the person having a college education. Mental appreciation increases proportionately with the increase in the degree of education.

It is also freely admitted, and therefore requires no further proof, that education radiates a beneficent influence on everyone with whom it comes in contact. But does it pay financially is the great question.

The latest and most successful attempt to answer the question by means of a scientifically conducted research was undertaken recently by the Alpha Kappa Psi fraternity in Commerce. The investigation covered and compared the various periods in life with regard to the earning capacity of elementary school, high-school and college graduates, and even those with higher educational training.

Between 7000 and 8000 persons engaged in professional, scientific, teaching and business occupations were investigated. Their earnings were classified with regard to the amount of education, in order to analyze the relationship between education and income.

The following interesting facts and figures obtained from this investigation prove "the dollar spent for education by the public or the individual goes out only to bring back ten."

The conclusions formulated from the investigation, while not at all unexpected, are very enlightening:

It shows that the high-school graduate, without further schooling, earns up to the age of 60, an average of $1100 per year *more* than does the elementary-school graduate.

* Utah Board of Pharmacy.

The college graduate, through the same period of life, earns an average of $3400 per year *more* than does the high-school graduate—a difference of $2300 per annum in favor of the college graduate.

The earnings in the different periods of life also make an interesting study:

The grammar-school graduates' earnings average highest between the ages of 45 to 54—$1700 per year.

The high-school graduates' largest average income is at the same age and amounts to $2800 annually.

College graduates were classified into several groups according to degrees received:

The A.B. degree produced the greatest average income between the age years of 60 and 64, which was estimated at $6200 annually.

The M.A. and Ph.D. degrees were found to be held mostly by teachers and professors and yielded a fairly level income throughout the teaching careers. The average per year for the M.A. was $4750 and for the Ph.D. $5000. The highest average was produced between the ages of 40 and 45.

The M.D. and D.D.S. degrees fluctuated from $1700 to $16,000 per year.

The college graduate with a degree in business administration, B.B.A., showed the highest return for the money invested in education. The highest average was earned between the ages of 45 and 49, being $11,500 per year.

Finally, the total average life earnings of each educational class were estimated and tabulated for comparison, showing at a glance the cash value of an education. The earnings for each class during the life period of work were:

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|---|---|
| Elementary-school graduate | $ 64,000 |
| High-school graduate | 88,000 |
| College, A.B. degree | 144,000 |
| A.B. combined with L.L.B. | 238,000 |
| Business Administration, B.B.A. | 200,000 |

Of course, many exceptions were found to the above figures, but only 5% of the number investigated reported larger earnings than the given average in lower grades and normally belonged to the higher grades of education.

The investigation not only proves conclusively that education produces larger incomes but also that the average earnings continue to increase through a longer period of life, to a greater age.

Does education pay? We must admit that it does. It pays in all walks of life. Pharmacy is no exception. A scientific education, such as a pharmacist acquires in a college of pharmacy to-day, spreads abroad the spirit of investigation, of observation, of accuracy, of truth and moral uprightness, and yields to the owner thereof a spiritual, mental and financial profit.

It is therefore natural that an organization like the National Association of Boards of Pharmacy should sponsor the cause of education in pharmacy as it has, because the ultimate responsibility rests with the licensing boards and the N. A. B. P., which is composed of the boards of pharmacy of 47 states, the District of Columbia and Alaska. Believing that a pharmacist must increase his store of knowledge to understand his relation to the community he serves, that personal development will make for professional and business development, and in the light of the figures quoted in this article—financial success, the N. A. B. P. has constantly worked for adequate educational requirements and must continue its efforts in this direction.

## OBITUARIES.

### WILLIAM PEARCE THOMASON.

William Pearce Thomason, member of the Alabama Board of Pharmacy since 1909, died in his home at Guntersville on November 4, 1928. His personality and faithful and efficient service endeared him to the other members of the board, and his passing will long be mourned.

He was born in Summit, Ala., June 25, 1876. His father was Dr. W. L. Thomason, who practiced medicine and owned a drug store. In 1883, he moved to Guntersville where, after the death of the father in 1897, the son took over the business. In 1911, Mr. Thomason was elected president of the Alabama Pharmaceutical Association and has remained in the pharmaceutical limelight in Alabama ever since.

His health had been failing since the fall of 1927, the cause being given as heart trouble and high blood pressure. For the past few months, he was confined to his bed most of the time.

The funeral, with Masonic honors, was held at Guntersville on November 7, all the members of the Alabama Board being in attendance.

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### CHARLES S. KOON.

Word reaches us that Charles S. Koon, former member of the Michigan Board of Pharmacy and prominent in the N. A. B. P. during his incumbency, died after a short illness in his home in Muskegon. Further details are not available as this is being written. Those who attended the Detroit convention in August 1914, will still remember his splendid address of welcome. The N. A. B. P. extends sympathy to the family in their bereavement.

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## CULLED FROM MANY SOURCES.

We have been having lots of company lately at the N. A. B. P. office. Russell B. Rothrock, secretary of the Indiana Board, stopped in recently. Walter H. Cousins of Texas and Dr. Robert P. Fischelis of New Jersey were in town for the N. A. R. D. executive committee meeting in November and Secretary Christensen had very enjoyable visits with them.

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The Indiana Board should be complimented for its efficient check-up on violations of the Harrison Narcotic Act, having recently brought three offenders, two physicians and a druggist of Evansville, before the Federal District Court. A prominent local physician was sentenced to serve one year and a day in the federal penitentiary at Leavenworth plus a fine of $300 and costs. The court ignored the plea of the druggist, who had been established in business in Evansville for 20 years, that he had prescriptions from reputable physicians to cover narcotics sold, and he was given the same sentence. Another physician, well past 60 and feeble, received more lenient treatment by the court and was only fined $300 and costs. The board of pharmacy will undoubtedly revoke the pharmacists' license at its December meeting.

While these sentences and the resultant ruin of the reputation of professional men who have stood well in their community for many years may seem somewhat drastic punishment, yet it is the only way by which respect for the law can be maintained. A law that is put on the statutes and then disregarded brings about a worse condition than no law at all.

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The Chairman of our Executive Committee, M. N. Ford of Ohio, enjoyed a hunting trip during November. He omitted telling us what luck he had—now what does that indicate?

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The nineteenth annual report of the Missouri Board of Pharmacy has been received during the month. It matches its predecessors in style and appearance, having a substantial and good-looking brown board cover. It is a comprehensive volume, containing much of historical value and information—pictures of the board members, annual financial report, complete minutes,

alphabetical lists of registered and assistant pharmacists with addresses, delinquent lists and the pharmacy law. Secretary Riske is to be complimented on this good piece of work.

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P. H. Klinkenberg, member of the Kansas Board of Pharmacy, has sold his pharmacy at Ottawa, Kans., to the Crown Drug Co., a retail chain with headquarters in Kansas City, Mo.

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John Culley was director and interlocutor of a minstrel show given by the Ogden, Utah, B. P. O. Elks lodge on October 31st. Remember the N. A. B. P. banquet which John planned in Portland? Judging from past performance, we would say without seeing it that the minstrel show was a big success.

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The Detroit Retail Druggists' Association reports that J. Edward Richardson and Clare F. Allan of the Michigan Board of Pharmacy are conducting a real clean-up campaign in Detroit. These two members meet every Thursday afternoon and conduct courts of inquiry. All violators rounded up in the previous week are required to appear before them. Within five weeks, it is reported that they have passed on 175 cases; in the more serious offenses, warrants are issued forthwith. Ten or twelve illegal stores have been put out of business.

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John Weeks Earnshaw, grandson of John W. Weeks, president of the Texas Board, won first prize at a baby show conducted at the Ballinger Fair recently, competing against 200 other babies. The other board members report considerable increase in chest expansion for Grandfather Weeks.

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## STATE BOARD NEWS.

**Alabama.**—Governor Graves has reappointed Hal E. Duncan of Birmingham a member of the board of pharmacy to succeed himself, and J. T. Dumas of Foley to succeed W. P. Thomason deceased.

**Arizona.**—The fiftieth semi-annual meeting of the board of pharmacy was held Nov. 12th to 14th, inclusive, at the State House in Phoenix. Forty-three took examination, and twenty-one applied for reciprocal registration through the N. A. B. P. In this connection Secretary Hulett writes:

"Our applications under N. A. B. P. reciprocal rules are increasing and the applicants all seem to be persons of good high standing. We consider this type of applicant as good as any, if not the best."

Conditions in pharmacy are good in Arizona, there being few violations and the welfare of the public is being protected. An amendment of the law pertaining to the sale of drugs will be asked at the 1929 legislative session.

**District of Columbia.**—Secretary Kerfoot sends out the following notice:

"Under the law of the District of Columbia to regulate the practice of pharmacy and the sale of poisons for other purposes, enacted by Congress, May 7, 1906, and amended February 27, 1907, and March 4, 1927, every licensed pharmacist and every licensed dealer in poisons who has been so licensed in the District of Columbia for not less than three years prior to the first day of November 1928, is, under Section 7 of the act, required to make application to the board of pharmacy for re-registration during the month of November 1928. Failure to comply will result in the suspension of license. The fee for licensed pharmacist is $3.00, for licensed dealer fifty cents."

**Georgia.**—W. T. Edmunds of Augusta has been appointed a member of the Georgia Board of Pharmacy to succeed M. D. Hodges of Marietta. The following officers were recently elected: *President*, Jesse Mitchell; *Vice-President*, L. C. Waldrop; *Secretary*, J. B. Pendergrast.

Reciprocal registration was granted in November to J. Hines Peacock of Texas.

**Kansas.**—Secretary King reports that plans are being made to introduce the model law in the legislature this winter and that most of the druggists in the state will support the measure.

An examination was held on November 14th and 15th—total of 65 being present, 28 for full registration and 37 for assistant registration. The results were not available at the time this goes forward.

**Michigan.**—Reciprocal registration was recently granted to Cleanthis C. Evangelidis, of Georgia, and James H. Foree, of Tennessee.

**New Jersey.**—Results of the practical pharmacy examination conducted by the board of pharmacy during the month of October are announced as follows:

A total of 109 candidates took the practical examination for the registered pharmacist certificate. Eighteen of those who passed had previously completed the written examinations successfully and were therefore granted certificates of registration. Sixteen of those who passed have not as yet completed the written work successfully but will have an opportunity to do so in January. Seventy-five failed to make a passing mark in the practical examination.

A total of 50 candidates took the practical examination for the assistant pharmacist certificate. Eight of those who passed had previously completed the written examination successfully and were therefore granted certificates of registration. Four of those who passed have not as yet completed the written work successfully and will have an opportunity to do so in January. Thirty-eight failed to make a passing mark in the practical examination.

The next examinations in the written work will be held on January 17, 1929, for the registered pharmacist certificate and on January 18, 1929, for the assistant pharmacist certificate. Applications must be completed and on file in the office of the secretary by January 2, 1929.

**North Dakota.**—E. P. Martin of Hazen is the new member of the board, appointed to succeed O. B. Sjurseth. There is still a vacancy on the board, no one having as yet been appointed to succeed Burt Finney.

Reciprocal registration was extended to the following on November 14th: Olaus F. Olson of Iowa; John L. Walker, Charles J. Hohn and Joseph Hlavac, all of Minnesota.

**Ohio.**—Forty-six of the ninety-nine candidates taking the October examination were successful in passing. Eight out of the fifteen assistant candidates also passed.

Reciprocal registration was granted to Harold J. Emptage of Maryland.

The highest grade made in the pharmacist examination was 93 per cent, by Isadore Thall of Columbus, and the high grade in the assistant examination was 90 per cent by Sam Lebson of Cleveland. Both are graduates of the College of Pharmacy of Ohio State University.

The board reorganized by electing the following officers, to be effective January 1, 1929: *President*, Charles Ehlers; *Vice-President*, Ralph C. Knisely; *Secretary*, M. N. Ford.

The next examination will be held in Columbus January 15th and 16th, 1929.

**Pennsylvania.**—Press reports state that the ownership law was declared unconstitutional by the United States Supreme Court. Assenting opinions, however, were voiced by Justice Holmes and Justice Brandeis.

A special meeting of the Pennsylvania State Pharmaceutical Association was held at Harrisburg, Thursday, November 22nd, for the purpose of discussing new legislation to take the place of the law declared unconstitutional. More than two hundred pharmacists were in attendance.

The results of the October board examinations are as follows: 88 out of 163 taking the pharmacist examination were successful; 49 out of 133 taking the assistant examination were successful.

**Virginia.**—An examination was conducted by the board of pharmacy on Tuesday and Wednesday, November 13th and 14th, at the Medical College of Virginia at Richmond. There were fewer than twenty-five applicants, mostly for the assistant certificate. Results will be published later.

Reciprocal registration was granted on November 16 to the following: Walter W. Parker, Jr., from North Carolina, Chilton B. Kirchmier from Louisiana; Upshur K. Henderson, Jr., from Maryland.

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## MALPIGHI TERCENTENARY.

The 300th anniversary of the birth of Marcello Malpighi, founder of microscopic anatomy, was celebrated, November 14th, by the University of California, Santa Clara University and Stanford University and members of the California Medical Association at Hotel Fairmont, San Francisco. Malpighi was member of faculties at Bologna, Pisa and Messina. He was born March 10, 1628, and died November 29, 1694.

# ORIGIN OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION.

BY FRANCIS E. STEWART.

The American Medical Association held its annual meeting in Richmond, Va., the first week in May 1881. During several months previous to this annual gathering much discussion had been going on relative to the relations existing between pharmacy and medicine, largely caused by the advent and rapid growth of the manufacturing houses invading the fields of the pharmaceutical and medical professions. For centuries pharmacists had prescribed over the counter and physicians had dispensed their own medicines before the segregation and specialization commenced which gradually separated the practitioners of pharmacy and pharmaco-therapy into two vocations. From the beginning of this specialization more or less antagonism existed between the two classes of practitioners. This was partly due to the fact that the boundary lines between them necessarily overlapped and were indistinct, and partly due to the third factor entering in, namely, the public at large and its demands for medicines for self-medication and domestic use. But now another factor had entered and complicated the problem still further, namely, the pharmacal and pharmaco-chemical manufacturing houses. They were practicing both pharmacy and pharmaco-therapy at wholesale and without license to practice either.

As I had taken prominent part in this discussion as a graduate in pharmacy and medicine, and advocated coöperation and coördination between the two vocations in promoting progress in the science of the materia medica and useful arts of pharmacy and pharmaco-therapy, I was invited by the chairman of the section on Practical Medicine and Materia Medica, of the American Medical Association, Dr. T. A. Ashby, of Baltimore, to read a paper before the section on "The Materia Medica of the Future." I had no paper ready and was obliged to write one for the occasion or refuse an excellent opportunity for presenting a resolution on the subject of materia medica monopoly as protected by patents and trade-marks, to which I had given considerable thought.

That article in the Code of Ethics of the American Medical Association dealing with the duties of its members for the support of professional character pronounced it "derogatory to professional character for a physician to hold a patent for any surgical instrument or medicine; or to dispense a secret *nostrum*, whether it be the composition or exclusive property of himself or others. For, if such nostrum be of real efficacy, any concealment regarding it is inconsistent with beneficence and professional liberality; and if mystery alone give it value and importance, such craft implies either disgraceful ignorance or fraudulent avarice. It is also reprehensible for physicians to give certificates attesting the efficacy of patent or secret medicines, or in any way to promote the use of them." And, again, under "Duties of the profession to the public," it was stated: "It is the duty of physicians, who are frequent witnesses of the enormities committed by quackery, and the injury to health and even destruction of life caused by the use of quack medicines, to enlighten the public on these subjects, to expose the injuries sustained by the unwary from the devices and pretensions of artful empirics and imposters. Physicians ought to use all the influence which they may possess,

as Professors in Colleges of Pharmacy, and by exercising their option in regard to the shops to which their prescriptions shall be sent, to discourage druggists and apothecaries from vending quack or secret medicines, or being in any way engaged in their manufacture and sale."

It was very evident to me that obedience to the spirit and letter of the code of ethics in regard to nostrums would be protective alike to legitimate practice of pharmacy and pharmaco-therapy, if generally lived up to by the medical profession; also if made aggressive as suggested would have much influence in repelling the invasion of the vocations of pharmacy and pharmaco-therapy by the nostrum manufacturers and their so-called "new remedy business," which was, essentially, the nostrum business under another name.

However, I recognized the fact that many of the official medicinal plants had their origin in the practice of Indian medicine men, quacks and old women, and cinchona bark was once a secret nostrum until divested of its nostrum characteristics. And I also recognized that the manufacturing houses had come to stay, and that, properly guided into scientific channels might become the salvation of professional pharmacy.

In my opinion, the key to the situation was the "new remedy business," especially as represented by preparations of new medicinal plants. Progress in the science of the materia medica and in the mutually dependent arts of pharmacy and pharmaco-therapy would certainly be promoted by the introduction of new medicinal plants to science and *brands* of preparations of the same to commerce; also, the proper interpretation and application of patents and trade-marks to the new remedy business might greatly aid in such promotion.

With these thoughts in mind I formulated a plan for its realization and was ready to present it to the Smithsonian Institution—an institution established at Washington by Smithson for the free diffusion of knowledge and a department of the central Government. I intended later to present it to the American Medical Association and AMERICAN PHARMACEUTICAL ASSOCIATION for discussion and further elaboration.

It was also very evident that the plan I was about to propose to the Smithsonian Institution—a plan intended to secure coöperation between the educational and industrial institutions related to the materia medica and materia medica supply business—could not be worked under a system of monopoly, secrecy and misleading advertising characterizing the commercial drug business. Therefore, as the opportunity presented to me by the chairman of the section on materia medica was a good one for offering a resolution on the subject of materia medica monopoly, I accepted the offer, wrote a paper on "The Materia Medica of the Future" and read it before the American Medical Association. After I read the paper, Prof. E. S. Dunster, of the University of Michigan, offered for me the following resolution:

> *Resolved*, That the spirit of the Code of Ethics forbids a physician to prescribe a remedy controlled by a patent, copyright or trade-mark. This, however, shall except (permit) a patent upon a process of manufacture or machinery; provided such patent be not used to prevent legitimate competition; also the use of a trade-mark to distinguish a brand of manufacture, provided the article so marked be accompanied by the working

formula, duly sworn to; and also by a technical scientific name under which anyone can compete in the manufacture of the same.

This resolution was referred to the Judicial Council to be acted upon at the next annual meeting at which time it was rejected on the ground that "said code contains all that is necessary for the proper guidance of the medical profession." A very significant fact in this connection may account for the decision of the Council. A plan was then under consideration for journalizing the proceedings of the Association and publishing the same in a journal to be established and known as the "Journal of the American Medical Association." The members of the Association behind this enterprise were counting upon the advertising patronage of the manufacturers for financial support. The passage of my resolution might have resulted in the loss of that support.

Soon after the adjournment of the American Medical Association, and on my way home to New York, I proposed the following plan to the Smithsonian Institution, not only hoping that the plan would be adopted by that institution, but also become a type for the manufacturing houses to follow as far as practical and appropriate for their "scientific departments" (which I hoped they would establish):

PLAN FOR THE INVESTIGATION OF THE MATERIA MEDICA OF THE WORLD UNDER GOVERNMENTAL AUSPICES.

1. Investigation of the Materia Medica of the world under governmental auspices, aided by the medical departments of the United States Army, Navy and Marine Hospital Service.

2. A chronologically arranged materia medica collection at the Smithsonian Institution representing the medicines used from earliest times by the various tribes, peoples and nations.

3. The sending of expeditions to investigate and explore unknown regions of the world, especially the unexplored regions of South America, for the purpose of obtaining new drugs.

4. The establishment of a pharmacological laboratory for the study of these drugs pharmacologically and therapeutically.

5. The publication of "Working Bulletins" (name suggested by Prof. Spencer F. Baird, Hon. Secretary of the Smithsonian Institution) containing all available information concerning such drugs, and the sending of preparations of the same to physicians engaged in private and hospital practice for clinical test and report.

6. Organization of Scientific Departments by the manufacturing houses engaged in the pharmacal and pharmaco-chemical industries for coöperation with the Smithsonian Institution in verifying the findings of the pharmacologic laboratory.

7. Organization of a National Pharmacologic Society, the membership to be composed of experts in all branches of pharmacologic science.

1. *Pharmacology.*—This is the science that treats of drugs and medicines; their nature, preparation, administration and effect; including pharmacognosy, pharmaco-dynamics, therapy-dynamics, pharmaceutical chemistry and pharmacy.

This definition is taken from the Pharmaceutical Syllabus, published and revised by the National Committee representing the AMERICAN PHARMACEUTICAL ASSOCIATION, The American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy. Reference to dictionaries generally shows this definition to be in harmony with all the lexicographers.

Conferences were held with the various departments of the army, navy and marine-hospital service, army medical museum, and national board of health.

Prof. Baird finally said that he considered the plan one of the most important ever brought to the attention of the Government. In papers read before the Alumni Association of the Philadelphia College of Pharmacy, the Philadelphia County Medical Society, the Ninth International Congress and the American Medical Association, in which I presented the plan in whole or in part, it was favorably discussed by leaders of pharmacy and medicine, including Prof. H. C. Wood, Sr., Joseph P. Remington, L. E. Sayre and others of note. It was endorsed by the Surgeon-General of the Army (Barnes), Surgeon-General of the Navy (Wales), and Surgeon-General of the Marine-Hospital Service (Hamilton). Prof. H. G. Byer, of the Smithsonian Institution, wrote me: "I think your conception of establishing a Bureau or Department of Pharmacology under the Government a grand one and no doubt one that ought to be carried out. We have here all sorts of scientific bureaus, and, it seems to me, not one which is calculated to be of such immediate benefit to mankind as a Department of Pharmacology would be to the American people, not to speak of the immense scientific value to medicine and pharmacy."

Space will not permit a detailed history of the results following this work immediately and afterward up to the present time. The American Medical Association memorialized Congress on the subject in 1891, and sent a copy of my paper advocating an investigation of the materia medica of the world to each member of the House and Senate. The memorial stated:

> "*Resolved*, That the Government of the United States be memorialized by the American Medical Association in favor of the plan proposed by Dr. F. E. Stewart, whereby the valuable work of the laboratories of the Army, Navy, Marine Hospital Service, Smithsonian Institution, Customs Service, Agricultural Department and other departments of the public service, in the line of the identification of drugs, may be facilitated and made of more general utility, by the publication of their results, so that the information thus gathered may be disseminated for the general benefit of the professions of medicine and pharmacy."

The AMERICAN PHARMACEUTICAL ASSOCIATION appointed me chairman of the special committee on National Legislation, and afterward chairman of the committee on Patents and Trade-marks—a position I have held almost continually ever since. Also the AMERICAN PHARMACEUTICAL ASSOCIATION passed resolutions endorsing the principles relating to professional pharmacy we advocated, and these resolutions were adopted by the American Medical Association, The National Retail Druggists' Association endorsed the same principles by resolutions for that purpose. The American Medical Association *published and editorially endorsed my paper entitled "Proposed National Bureau of Materia Medica," and this paper afterwards became the basis of its Council on Pharmacy and Chemistry.* (See *Journal of the A. M. A.*, April 27, 1901.)

## COMMENTS AND CONCLUSIONS.

The object of my life work has been to place the introduction of new therapeutic agents upon a coöperative, *i. e.*, professional, basis. On such a basis the burden of expense attending the introduction of new products would be shared

between the educational and industrial institutions, and the artificial demand for "new remedies" created by misleading advertising corrected by impartial discussion in professional societies and professional press. Under such a coöperative system *brands* of new products can be advertised in the advertising pages of the medical and pharmaceutical journals without endangering the integrity of the reading pages. For example, under such a system as now exists in relation to condensed milk the medical and pharmaceutical societies and press are in position to discuss condensed milk as a food product without interfering with the advertising of *brands* of condensed milk. Furthermore, *brands* of condensed milk are distinguished from each other by trade-marks and trade names. And the more brands the more advertisers.

The advantages of the coöperative or professional system for the introduction of new therapeutic agents are as follows:

1. It stimulates coöperative pharmacologic and therapeutic research by the medical and pharmaceutical professions and manufacturing houses and the publication of the results by donations to the professional societies and press and thus increases the educational value of each.

2. The increased value of the medical journals as media for conveying knowledge concerning new products increases their circulation, and this, in turn, increases their value to the manufacturers of brands of the same as advertising media. The same applies to the pharmaceutical journals also.

3. It stimulates competition between the manufacturers of brands to excel in quality of product. The professional system insures common standards and magnifies the importance of pharmacopœias. The reduction of the products on the market to common standards, while it may "rob the manufacturers of the advertising advantage of claiming their commercially controlled products as better therapeutic agents than those of their competitors," yet, as *skill* cannot be standardized, the gain to all concerned is greater to houses possessing skill than the gain to be obtained by pretense in advertising.

4. The temptation to decry the merits of new products because of commercial rivalry is removed and desire to promote the investigation and use of such products is substituted for it because of the realizing sense that the introduction of each new product of therapeutic merit is profitable to all, as all are equally concerned.

5. It lifts the embargo on the medical press imposed by the monopoly system and permits the medical journals to impartially discuss the therapeutic claims for new products in the reading columns without fear of losing advertising patronage. For example, the advertising of brands of diphtheria antitoxin in the advertising columns of the medical journals has not hindered the impartial discussion of the therapeutic value of diphtheria antitoxin in the reading columns.

6. It permits medical scientists to enter the employ of the industrial institutions engaged in the pharmacal and pharmaco-chemical industries to do research work for monetary reward as well as scientific credit, thus encouraging them to choose research work as a vocation. Under the prevailing competitive system research work in commercial laboratories is discouraged.

7. It permits the medical and pharmaceutical schools and colleges to throw open their laboratories to research workers for solving probems of both scientific

and commercial importance for the industrial institutions without danger of charges of collusion with the manufacturers of "proprietary" medicines.

8. It places the faculties of the medical and pharmaceutical schools and colleges in position to teach their students knowledge relating to the more recent additions to the materia medica without the danger of unwittingly teaching errors due to commercial exploitation.

9. It creates a demand for departments in educational institutions for the teaching of pharmacologic science and the arts upon which that science is dependent.

10. It creates a new and most promising field of work for the graduates of such institutions in the employ of industrial institutions carrying on their vocations in coöperation and coördination with the medical and pharmaceutical schools and colleges.

11. It places the pharmacal and pharmaco-chemical industries on a professional basis of such character that capital invested in research work may receive the protection afforded by the correct application of the patent and trade-mark laws without violating the ethical principles upon which the science of medicine and the practice of the medical arts of pharmacy and pharmaco-therapy are founded.

12. Owing to the fact that medical and pharmaceutical discoveries are at once appropriated by commerce for money-making unless protected by secrecy or patent it has been objected that the above plan is not based upon sound business principles. For that reason methods combining patents with licenses have been evolved and are in successful use. These plans for the protection of science and legitimate professional and commercial interests now in vogue are illustrated by the method of introducing insulin to science and brands of the same to commerce employed by the University of Toronto. Various modifications of the license plan are also successfully employed for the same purpose in which inventions and discoveries are patented and their production licensed under rules protective alike to educational and industrial institutions, protective to the medical and pharmaceutical press and its advertising patronage, and protective to the public health and general welfare.

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## CENTENARY OF THE BIRTH OF JACOB BOLL.

Jacob Boll, friend of Prof. L. Agassiz, distinguished zoölogist, of Harvard, lived in Dallas during the later years of his life and is buried in Greenwood Cemetery of that city. In writing of him, Prof. Samuel Wood Geiser—head of the Department of Biology, Southern Methodist University—states that among those with whom Professor Boll met at social gatherings in the home of Agassiz were not only scientists but other colleagues: Longfellow, Felton, Pierce, Asa Gray, Wyman, Channing, Emerson, Whittier, Ticknor, Motley, James Russell Lowell, Edward D. Cope and others.

Professor Boll was for a number of years custodian of the zoölogical department at Harvard. He died, in 1880, while on an expedition in West Texas, collecting fossils for institutions and museums.

After a gymnasium career in Switzerland and several years at the University of Jena, Jacob Boll returned to his native town of Bremgarten, in the canton Aargau, where he entered the practice of pharmacy and continued in the profession for about seventeen years. He held the esteem of the officials of his prefecture, and for a number of years was governmental examiner of physicians and pharmacists of his district. During these years and thereafter until his demise Professor Boll carried forward his studies in natural history with consuming zeal. He was born in Bremgarten, Switzerland, May 29, 1828.

# PROCEEDINGS OF THE LOCAL BRANCHES

**"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.**

**ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."**

**ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."**

**Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.**

## BALTIMORE.

The November meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Emerson Hotel on Tuesday evening, November 27, 1928, with President L. M. Kantner in the chair.

Dr. David I. Macht, Lecturer in Pharmacology, Johns Hopkins University, and Director of the Pharmacological Research Laboratory, Hynson, Westcott & Dunning, was the speaker. His subject was entitled the "Big Four" and dealt with a discussion of the four most common forms of poisoning occurring in the United States at the present time, namely, poisoning with Phenol, Mercuric Chloride, Carbon Monoxide and Methyl Alcohol.

Dr. Macht in his discussion not only gave a description of the principal points in connection with the toxicology of the above poisons, but also described original researches which have been carried out by him at various times in connection with each one of the poisons mentioned, and furthermore, he emphasized certain sociological and medico-legal aspects of interest not only to the physician but to the druggist and the public in general.

In connection with phenol poisoning attention was called by him to the danger of washing the stomach of victims from that poison with solutions of alcohol, which have been found by him, experimentally, to hasten a fatal outcome. The best method of treating carbolic acid poisoning was shown to be lavage with solutions of sodium sulphate.

In connection with the discussion of bichloride poisoning special attention was called by the speaker to the prevalence of mild and chronic forms of poisoning unnecessarily fatal caused by this drug. This is often a result of its use in douches and washes. Dr. Macht described his well-known work on the absorption of bichloride and other poisons from the genito-urinary tract.

In connection with a discussion of carbon monoxide poisoning the speaker dwelt on the prevalence of mild forms of intoxication produced by illuminating gas due to defective cooking and heating implements. The modern treatment of carbon monoxide poisoning by Henderson's method of artificial respiration and inhalation of mixtures of oxygen and carbon dioxide were described and the author also spoke of his own investigations which have demonstrated the beneficial effects of irradiations with ultraviolet rays in hastening elimination of carbon monoxide from its dangerous combination with hemoglobin.

In connection with methyl alcohol poisoning the speaker dwelt on the danger of adulterated liquors so prevalent since the advent of prohibition and pointed out the great toxicity not only of crude wood alcohol but even of chemically pure medicinal alcohol. The speaker also discussed the relative toxicity of different other alcohols and concluded his lecture with a plea for at least an elementary knowledge among pharmacists of the toxicology of the more common drugs and poisons.

The Baltimore Branch decided to offer membership in the AMERICAN PHARMACEUTICAL

ASSOCIATION for one year as an annual prize to a student of the School of Pharmacy of the University of Maryland, who is recommended by the faculty as having attained a high standing in his or her classes; $125.00 will endow this membership, and it was voted to set aside the proportionate amount necessary each year for three years. The membership is to start at once, and the $5.00 is to be paid from the treasury of the Branch for the first three years.—B. OLIVE COLE, *Secretary-Treasurer.*

## CHICAGO.

The 177th meeting of the Chicago branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday, November 20th at the University of Illinois School of Pharmacy.

President Gathercoal opened the meeting with comments about his experience in prescription work and the problems that confront the pharmacists.

A prescription clinic conducted by Prof. C. M. Snow held the attention of the audience for the evening. Many prescription difficulties were presented and methods suggested for eliminating the trouble. Very interesting comments were made by Messrs. Gray, Linke and Emig regarding certain prescriptions and the meeting proved to be of great value to all present.

Others participating in the discussions were Messrs. Becker, Webster, Titus, Schkolnik and Morrison.

S. W. MORRISON, *Secretary.*

## DETROIT.

### OCTOBER.

The October meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held October 8, 1928, in the Y. M. C. A. building. Dinner was served to twenty-four members and guests; the meeting was called to order by President Byce immediately after dinner. The minutes were read by the Secretary and approved.

Chairman Lakey of the Program Committee, reported that the H. K. Mulford Company will present a program in the near future demonstrating the new Snake Poison Serum, accompanied by moving pictures. He also announced that Mr. H. A. B. Dunning would be in Detroit in the near future and suggested that plans be made for his reception.

Mr. Ingram asked that the meeting pause in deliberation as a tribute to and in memory of one of its most ardent workers, the late Mr. W. A. Hall who had answered the last call.

Mr. Seltzer made a motion that suitable resolution be drawn up and spread upon the minutes in his memory and suggested that Mr. Ingram serve on this committee.

Dean Stout was nominated to succeed Mr. Chase as delegate to the House of Delegates to represent the Detroit Branch for the next three years and Mr. Ingram to serve as chairman of the membership committee.

Leonard A. Seltzer gave a very interesting paper titled "The Remedy for the Overcrowded Condition in the Retail Drug Business." He suggested standardizing the assistant for the betterment of the existing conditions.

R. T. Lakey spoke of the reversal of form of the Board of Pharmacy, relative to the recent examinations. "In the past," he said, "more assistant pharmacists were passed, while at present more registered pharmacists were given their certificates." "This," the Dean said, "increases the potential number of proprietors."

Mr. Ingram spoke of the conditions in many of the drug stores of to-day. J. H. Webster defended the present-day pharmacist and Mr. Webster, Jr., spoke for the encouragement of the student in saying—"that in his way of thinking it meant wait, whether at school or in the drug store, if Mr. Seltzer's scheme were put into operation."

President LaCroix of the Detroit Retail Drug Association, enlarged on Mr. Ingram's remarks, supporting Mr. Seltzer in his ideas of standardizing pharmacists to advance the betterment of pharmacy, and in turn cut down the number of undesirable drug stores.

Mr. Seltzer suggested that a committee of three be selected to draw up a suitable resolution to be forwarded to the board of pharmacy.

A rising vote of thanks was given to Mr. Seltzer.

BERNARD A. BIALK, *Secretary.*

### NOVEMBER.

The November meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Thursday evening, November 15, 1928, in the Y. M. C. A. building. More than thirty attended dinner which was increased to nearly seventy-five when the meeting was called to order. In the absence of President Byce, Vice-President Francis Koelzer took the chair. The minutes were read by the Secretary and approved.

Mr. Lakey reported that the December program would be taken care of by Parke, Davis & Company at which time Dr. Klein would talk on "Manufacture of New Biologicals," illustrated by moving pictures.

The Mulford Company will present a paper on Snake Poison Serum, illustrated by moving pictures at the January meeting. He also asked that the students be encouraged in their splendid work, and promised further programs in the near future.

Mr. Koelzer introduced Mr. Parker, representing the student body, who in turn introduced Mr. Lidell, chairman of the students of the College of Pharmacy of the City of Detroit.

A very interesting program was presented by the Alpha Eta Chapter of the Phi Delta Chi and the Pharmakons. The first speaker was Mr. Lidell, who spoke on "Pharmacy, the Keystone of the Drug Store."

Mr. Parker introduced Miss Andaziak, president of the Pharmakons, who spoke on the aims of the Pharmakons in promoting interest in Pharmacy among women pharmacists.

Thelma Beaubian spoke on "Aesthetics of Pharmacy," while Miss Erwin spoke on "The Relation of Women to Pharmacy."

Messrs. Stone and Irwin debated "Whether Raising the College of Pharmacy Course to Four Years Will Limit the Number of Drug Stores."

After a very interesting debate, Mr. Lidell made the rebuttal. A general discussion followed, led by Mr. Webster who corrected several ideas that students had on the future of pharmacy.

He was followed by Mr. Ingram who encouraged the Pharmakons in their splendid work and stated that 10 to 25 per cent of the help to-day in the retail drug stores were women.

W. L. Scoville pointed out the value of foods in the drug store and the great possibilities presented to the pharmacist in handling the proper kind of foods.

Mr. Seltzer complimented the students on their splendid program and hoped they would be encouraged to give many more programs in the future.

Dr. Dikeman, staunch supporter for the student program idea, answered the problem of the overcrowded condition of drug stores by placing the blame on many supply houses for installing stores where, in many instances, there was a lack of capital to carry on the business.

A rising vote of thanks was given to the students.

BERNARD A. BIALK, *Secretary.*

## PHILADELPHIA.

The November meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, November the 13th, at the Philadelphia College of Pharmacy and Science. The meeting was preceded by the customary dinner, served in the College Building. Almost seventy members and guests attended.

The auditorium was converted into a court to carry out the program for the evening—a Mock Trial, to which a large number of students, guests and their friends had been invited. It was not the intention of the Local Branch to produce a burlesque, but instead to illustrate one of the hazards of professional service to the public. The cast follows:

*Judge*—Hon. Frank E. Smith, Common Pleas Court, Philadelphia County.

*Attorneys*—For Plaintiff—Franklin E. Barr, Esq., Assistant District Attorney, Philadelphia County.

*For Defendant*—Howard Kirk, Esq., Lecturer, P. C. P. and S.

*Complainant's Side*—Defendant—Ivor Griffith, Assistant Professor, P. C. P. and S.

*Defendant's Clerk*—Ralph L. Calvert, Instructor P. C. P. and S.

*Physician*—Dr. William S. Wadsworth, Coroner's Physician, Philadelphia County.

*Chemist*—Charles H. LaWall, Dean P. C. P. and S.

*Wholesaler's Representative*—E. T. Hahn.

*Court Officers—Clerk*—Harry Botthoff, Common Pleas Court, Philadelphia County.

*Stenographer*—Kathryn Foran, former Faculty Stenographer, P. C. P. and S.

*Tipstaves*—L. G. Freeman, George W. Perkins, Arthur Osol, L. G. Cordier, Instructors P. C. P. and S.

*Door Usher*—Walter Wilcox, Janitor P. C. P. and S.

The Jury selected and sworn in consisted of John C. Eckel, Esq., *foreman;* W. L. Cliffe, Mrs. E. D. Michener, Raymond Hendrickson, Mrs. Charles H. LaWall, Mrs. C. Louis Seip, Miss Herma Rohn, Edwin I. Thompson, Philip H. Johnson, E. Clinton Rhoads, Brua C. Goodhart and J. C. Peacock.

The case of Ada S. Capwell *versus* Ivor

Griffith was then called. A brief outline is here given. The plaintiff (Ada Capwell) had sent a messenger (Strock) to the drug store of the defendant (Griffith) to purchase some aromatic spirit of ammonia. Upon receiving it, she had taken a dose and had become violently ill—in fact, so ill that she was forced to lose much time from her work and to pay a rather large doctor bill. Consequently she sued the druggist (Griffith) in order to recompense herself for the suffering and financial loss she had sustained. She had sent the bottle of aromatic spirit of ammonia to a chemist (Harrisson) for analysis and he had found that the specimen contained crude ammonia and about 7 per cent pyridine.

After bitter argument and sharp questioning between the opposing sides, Judge Smith charged the jury to remember that in a negligence case such as this one, the burden is on the plaintiff to prove herself injured by some act of the defendant. Did the plaintiff do anything to contribute to her own injury? The verdict quickly given by the jury was in favor of the defendant.

It is most pleasing to note that the total attendance at the trial was between six and seven hundred persons, and at the conclusion, they were most generous in their expressions of approval as to the value of the evening.

A short meeting of the Branch followed the Mock Trial. President Nichols presided. The Secretary announced the names of the following applicants for membership in the parent body: Walter C. Dietrich, John M. Woodside, Sol. Paul Hanig, George Edwin Byer.

These were accepted for Branch membership pending the action of the parent body.

The following resolution was passed by the Branch and the Secretary was instructed to send a copy to the various pharmaceutical journals and to Col. S. O. Wynne:

"WHEREAS the administration of the Prohibition Act in this district has been increasingly intelligent and efficient during the past few years and

"WHEREAS this desirable condition is directly traceable to the able administrative qualities of Col. S. O. Wynne and to the business and pharmaceutical experience of the two assistant administrators, Messrs. Hunsberger and Macphee,

"*Therefore* be it resolved that the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION express its confidence of the Philadelphia prohibition office as conducted by the present administration and further entertain the hope that no changes in its administrative personnel may be brought about."

On motion, President Nichols was instructed to appoint a committee to draw up a suitably worded expression of sympathy to be sent in the name of the Branch to Mrs. Krause, widow of one of our most prominent members, Otto Krause.

M. S. DUNN, *Secretary.*

## PITTSBURGH.

The regular meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the College of Pharmacy Tuesday November 20, 1928.

The feature of the evening was, however, deferred to a future session to permit the members to attend in a body a public meeting at which Senator Arthur Capper, of Kansas, and Congressman Clyde Kelly, of Pennsylvania, made addresses in behalf of the Capper-Kelly Bill, commonly known as the Fair Trade Act.

The speakers outlined in detail the provisions of the Bill as it now reads, and entered into a discussion of the necessity for such a measure, to prevent the annihilation of the independent retail merchants of the country.

They assured the audience of some 1200 persons, that they had every reason to believe that the bill would be passed at the next regular session of Congress.

The meeting was sponsored jointly by the Western Pennsylvania Retail Druggists' Association, The Retail Hardware Merchants' Association and Retail Jewelers' Association of this section of the state.

LOUIS SAALBACH, *Secretary.*

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**Secretary J. G. McBride,** of the Nebraska Pharmaceutical Association, was elected member of State Legislature by an overwhelming majority and we wish to congratulate Nebraska pharmacists on the election of one of their influential members.

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1927–1928.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 2.

November 8, 1928.

*To the Members of the Council:*

(*Motion No. 1.*) *It is moved by Eberle that the minutes of the first meeting of the Council, 1928–1929, presented in Council Letter No. 1, be approved.*

*24.* For the information of new members of the Council it is pointed out that motions made by mail in the interim between meetings of the Council require no second.

*25. Use of the Text of the N. F. V.* The following communication has been received from Chairman DuMez of the Committee on Publications:

"I have gone over the request of B. L. Paley, D.D.S., to publish the dental formulas of the National Formulary V in the Dental Magazine.

"It appears that Dr. Paley is impressed with the value of these dental preparations and that his only object is to bring this information to the dentists at large. I am, therefore, recommending as Chairman of the Publication Committee that permission be given Dr. Paley to use the dental formulas and such other formulas as may be of interest to dentists in an article for publication in the Dental Magazine, and that no charge be made for the reproduction of the formulas in this case."

(*Motion No. 2.*) *It is moved by DuMez that Dr. P. L. Paley of New York City be given permission to use the dental formulas and such other formulas in the N. F. V. as may be of interest to dentists in an article for publication in the Dental Magazine and that no charge be made for such use.* (Please use enclosed card for voting.)

*26. Use of the Text of the N. F. V.* The following communication has been received from Chairman DuMez of the Committee on Publications:

"I have gone over the sample pages of Dr. Lynn's book on 'Pharmaceutical Therapeutics,' and as Chairman of the Publication Committee I recommend that permission to use portions of the National Formulary V text for comment in his book be granted Dr. Lynn and that a fee of $5.00 be charged for this purpose. Please present this to the Council for a vote."

(*Motion No. 3.*) *It is moved by DuMez that Dr. E. V. Lynn, Seattle, Washington, be granted permission to use the text of the N. F. V. for partial reproduction in his book on "Pharmaceutical Therapeutics" and at the usual charge of $5.00.*

*27. Applicants for Membership.* The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 1, James Alban Berry, 5045 North Mango Ave., Chicago, Ill.; No. 2, P. W. Blaufuss, P. O. Box 623, Mason City, Iowa; No. 3, Ralph C. Benedum, 1010 Penna. Ave., East Liverpool, Ohio; No. 4, Harrison Raymond Boggs, 207 New Jersey Ave., Collingswood, N. J.; No. 5, H. Brandon, 1270 Broadway, New York, N. Y.; No. 6, Donald Breisch, 1816 Geddes Ave., Ann Arbor, Mich.; No. 7, Mae Butler, 4025 12th St., N. E., Seattle, Wash.; No. 8, Fred Burns Campbell, 4730 14th St., N. W., Washington, D. C.; No. 9, Paul Q. Card, 301 Clinton Ave., Wenonah, N. J.; No. 10, William E. Chapman, Fairlee, Vermont; No. 11, Harry G. Cornfeld, 1001 Clifton Ave., Collingdale, Pa.; No. 12, Wm. T. Darby, Jr., 1729 Portland Ave., Louisville, Ky.; No. 13, Henry George DeKay, School of Pharmacy, Purdue University, LaFayette, Ind.; No. 14, C. Suttan Dudley, Comanche, Texas; No. 15, Ali Mohammed Elshaarani, Manyal St., Cairo, Egypt; No. 16, Donald S. Evans, Orange & Central Aves., Orlando, Fla.; No. 17, Frederick Charles Felter, 35 N. 9th St., Portland, Ore.; No. 18, S. H. Fetherston, 559 Mission St., San Francisco, Calif.; No. 19, A. Freeda, 110 E. 41st St., New York, N. Y.; No. 20, Enrique A. Gonzalez Flores, Brumbaugh St. 11, Rio Piedras, Porto Rico; No. 21, Earl Guth, R. F. D. No. 1, Box 52, Seattle, Wash.; No. 22, K. H. Hall, Rex Arms Apts., 2840 Forrest Ave., Kansas City, Mo.; No. 23, Wilton C. Harden, 9 Melvin Ave., Catonsville, Md.; No. 24, M. A. Hat-

field, Medina, Texas; No. 25, Henry W. Heine, Purdue University, School of Pharmacy, Lafayette, Ind.; No. 26, Elsa Hillebrecht, 2414 Spruce St., Bellingham, Wash.; No. 27, Einer E. Johnson, 4508 16th Ave., N. E., Seattle, Wash.; No. 28, Max H. Kaliner, 4222 Lancaster Ave., Philadelphia, Pa.; No. 29, Floyd J. LeBlanc, State College Station, Brookings, S. D.; No. 30, H. E. Lupus, 108 North 5th St., Philadelphia, Pa.; No. 31, Paul J. Mandabach, 440 S. Dearborn St., Chicago, Ill.; No. 32, Hugh McCanse, 936 E. Flanders, Portland, Oreg.; No. 33 John P. McKown, 12 Madison St., West Medford, Mass.; No. 34, Alfred Richard Moore, % Montreal General Hospital, 20 Dorchester St. East, Montreal, Canada; No. 35, Hugh H. Mottern, 218 Water St., Baltimore, Md.; No. 36, Carl A. Muehlebach, 1118 Grand Ave., Kansas City, Mo.; No. 37, John D. Muir, 348 Charles Ave. S. E., Grand Rapids, Mich.; No. 38, Chas. C. Orr, 8232 Eberhart Ave., Chicago, Ill.; No. 39, Albion L. Page, 62 Cortlandt St., New York, N. Y.; No. 40, W. Luther Parker, 4700 14th St., Detroit, Mich.; No. 41, Jacob S. Perloff, 1621 N. Marshall St., Philadelphia, Pa.; No. 42, Arthur Ferdinand Peterson, 504 University Ave., S. E., Minneapolis, Minn.; No. 43, Paul A. Piper, 1012 Main St., Wheeling, W. Va.; No. 44, A. John Schwarz, 874 Union Ave., Memphis, Tenn.; No. 45, Hallie Chris Seawell, 3523 14th St., N. W., Washington, D. C.; No. 46, Elmer Shelberg, 1415 Cornelia Ave., Waukegan, Ill.; No. 47, Jacobo Simonet, University of Porto Rico, Hato Rey, P. R.; No. 48, Sister Mary Amadeus, Mercy Hospital, Chicago, Ill.; No. 49, Frank James Slama, 742 N. Patterson Park Ave., Baltimore, Md.; No. 50, Chas. A. Snyder, Rittman, Ohio; No. 51, Rolland S. Snyder, 2543 Marion Ave., New York, N. Y.; No. 52, T. B. Tipton, 1400 14th St., N. W., Washington, D. C.

(*Motion No. 4.*) *Vote on applications for active membership in the American Pharmaceutical Association.*

*28. Applicants for Membership on Account of Contributions to the Headquarters Building Fund.* The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to membership and you are requested to vote on the applications which have been properly endorsed.

H-1, Benedict J. Carton, 2666 E. Huntingdon St., Philadelphia, Pa.; H-2, Kenneth Agee Chapman, McCleary, Wash.; H-3, Jacob Friedman, 89 Aldine St., Newark, N. J.; H-4, Dana Garelick, 918 Edison St., Salt Lake City, Utah; H-5, Harold Milton Goldblatt, 1105 Elder Ave., New York, N. Y.; H-6, James Lokey, 4008 Junius St., Dallas, Texas; H-7, Nathan Theodore Miller, 355 East 45th St., Brooklyn, N. Y.

(*Motion No. 5.*) *Vote on applications of contributors to the Headquarters Building Fund for membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

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## PERMITS—FORM 1410.

The Prohibition Bureau has called attention that permits, Form 1410, may be filed with Administrators after December 20th, instead of waiting until January 1st.

## NEWTON (MASS.) BOARD OF ALDERMEN DENIES VICTUALLER'S LICENSE TO DRUG STORE.

The Newton Board of Alderman were petitioned for common victualler's licenses by a Chain Store company July 25th. The petition was denied. The Company more recently made another request which also was denied. In considering the advisability of granting the request it was stated by one of the Aldermen that "about eight per cent of the business in the Company's stores is in compounding prescriptions," and it was concluded that the remainder of the business represented merchandise. The Alderman argued that "to combine the drug business with lunch-room business will create a menance to health, stating that it is quite possible for a drug clerk compounding a prescription and handling powerful drugs, to pause in such work to serve food, without properly washing his hands, and thus transmitting drugs onto food served. He also contended that if a drug clerk is interrupted in the compounding of a prescription to act as a lunch-counter man, accurate filling of the prescription will be doubtful."

## NUMBER OF PATIENTS TREATED IN ARMY HOSPITALS DURING 1927.

In a *Bulletin* issued by Chairman A. L. I. Winne, an article of the *Washington Post*, for November 25, 1928, is quoted commenting on the report of Surgeon-General Ireland for the calendar year 1927. In this article it is stated that the total number of patients among military personnel treated in hospitals and dispensaries, from all causes, was 87,266. The number of those who were beneficiaries of the Veterans' Bureau was 11,625 and the 20,393 others included retired officers, enlisted men, dependents of military personnel, Government employees and summer citizens' military trainees.

Chairman Winne uses the language of the paper, which does not make it clear whether the groups of 11,625 and 20,395 were included in the 87,266 treated, or whether they were in addition to that number. That is not important. The total of over eighty-seven thousand patients is sufficient to be of interest when it is realized that each one of these in some fashion or other was dependent upon a certain amount of pharmaceutical service, either directly or indirectly, and viewed in the knowledge that the Army has not any adequately trained pharmacists to take care of that important part of hospital treatment.

The Surgeon-General in his report is quoted in this paper as calling attention to "a distressing shortage" of personnel in the Medical Department of the Army, which becomes "increasingly serious." He states that nothing short of legislation can afford relief. If he could see his way clear to coöperate in the plan to establish a Pharmacy Corps in the U. S. Army he would find that a great deal which is contributing to the "increasingly serious" situation in which he finds the Army medical department would be taken care of.

There are many functions which competent pharmacists could perform for the hard-pressed Army doctor—the doctors who are actually practicing medicine, as distinguished from those who are administrative officers—which would greatly lighten his burdens and enable him to spread his activities over a larger group of patients; functions which the present type of so-called Army pharmacist knows little or nothing about. It was stated that during the late war a physician and two pharmacists were capable of taking care of as much routine work as two, and even three, physicians, by the physician directing the work and using the technical knowledge possessed by the educated pharmacist. Whether this was actually put into effect we do not know. We doubt that it was tried, because the educated pharmacists were used in the late war in almost every capacity except that of pharmacists. But the statement is of some interest, because it is partially correct—correct with respect to the possibilities which it implies. A physician with the assistance of educated pharmacists certainly has a greatly enlarged field of activity, and ought to be able to make as good use of such assistance in Army medical practice as the physician in civil life is able to do. The establishment of a Pharmacy Corps in the Army would go a long way toward relieving the "increasingly serious" situation which the Surgeon General talks about, and it would afford those eighty-seven thousand patients a greater measure of safety and protection.—Parts of a *Bulletin* by A. L. I. Winne, Chairman.

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## INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY.

President Coolidge, on December 6th, transmitted to the Congress of the United States a report by the Secretary of State recommending, at the request of the Secretary of the Treasury, the Secretary of War and the Secretary of the Navy, constituting, together with the Surgeons-General of the three medical services of the Treasury, War and Navy Departments, an advisory board under the Federal act to incorporate the Association of Military Surgeons of the United States, approved January 30, 1903, that Congress be requested to authorize an appropriation of $5000 for the payment of expenses of delegates of the United States to the Fifth International Congress of Military Medicine and Pharmacy to be held at London, England, in 1929.

The recommendation has the President's approval, and he requested of Congress legislation authorizing an appropriation of $5000 for the purpose of participation by the United States by official delegates in this Congress.

Reference to this International Congress of Military Medicine and Pharmacy will be found in the November JOURNAL, pages 1159–1160. As pharmacy of most of the European and South American countries will be represented, the pharmacists of the United States should also have delegates, not only to represent American pharmacy, *but pharmacy by pharmacists.*

# EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* D. F. JONES, *President;* A. W. PAULEY, W. H. ZEIGLER, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* AMBROSE HUNSBERGER, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; W. L. SCOVILLE, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; J. C. MUNCH, A. L. I. WINNE, P. H. DIRSTINE, R. B. ROTHROCK, LYMAN F. KEBLER; A. G. DUMEZ, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; H. M. LEROU, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

## NEW AND NONOFFICIAL REMEDIES.

The following additional articles have been accepted as conforming to the Rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the Rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

**DIPHTHERIA IMMUNITY TEST (SCHICK TEST)** (See New and Nonofficial Remedies, 1928, p. 390).

H. K. Mulford Company, Philadelphia.

*Diphtheria Toxin for the Schick Test* (see New and Nonofficial Remedies, 1928, p. 291): Also marketed in packages of two 10-cc. vials (M 213), one containing undiluted diphtheria toxin and the other containing sufficient sterile solution of sodium chloride for dilution to make 100 test doses of 0.1 cc. Schick Test Control is also supplied in packages of one 10-cc. vial (M 214), containing heated and diluted diphtheria toxin sufficient for at least 100 tests.

**TETANUS ANTITOXIN, CONCENTRATED** (See New and Nonofficial Remedies, 1928, p. 356).

Parke, Davis & Co., Detroit.

*Tetanus Antitoxin Globulin.*—Also marketed in piston syringe containers, containing 20,000 units (Bio. 149).

**DIPHTHERIA TOXIN-ANTITOXIN MIXTURE** (See New and Nonofficial Remedies, 1928, p. 366, and *The Journal,* Oct. 13, 1928, p. 1109).

United States Standard Products Co., Woodworth, Wis.

*Diphtheria Toxin-Antitoxin Mixture 0.1 L+ (Non-Sensitizing).*—Each cubic centimeter constitutes a single dose of diphtheria toxin neutralized with the proper amount of antitoxin produced from goats. Marketed in packages of three vials, each containing 1 cc.; in packages of one vial containing 10 cc.; and in packages of one vial containing 30 cc.

From *Journal A. M. A.,* Oct. 20, 1928.

**PHENTETIOTHALEIN SODIUM.**—Phentetiothaleinis Sodium.—Phenoltetraiodophthalein Sodium.—NaO.O: C.$C_6I_4$.C: $C_6H_4OC_6H_4$-ONa. The sodium salt of a dibasic dye, phenoltetraiodophthalein. Phentetiothalein sodium contains from 56 per cent to 59 per cent of iodine.

*Actions and Uses.*—Phentetiothalein sodium is used for the roentgenologic examination of the gall-bladder and simultaneous test of hepatic function. Following the intravenous injection, the solution appears in the normal gall-bladder in sufficient concentration to cast a shadow to the roentgen rays and if the liver is damaged it is retained in the blood in amounts indicative of the extent of impairment. It is claimed to cause little or no toxic reaction.

*Dosage.*—Intravenously for visualization of the gall-bladder and simultaneous test of liver function, 40 mg. per kilogram of body weight; the dose need not exceed 2.5 Gm., regardless of weight. The dye is dissolved in freshly distilled water, filtered through fine filter paper, and sterilized for fifteen minutes in a boiling water-bath. A solution of 8 per cent has been found satisfactory. The solution is injected intravenously by gravity or syringe method, either in the morning between 8 and 9 or in the evening between 5 and 9. If given in the evening the evening meal should be omitted and no food given until the first roentgenogram is taken in the morning. At this time a fat meal is given and the roentgenogram taken one hour after the meal and, if desired, another three hours after the meal to determine the rapidity and characteristics of emptying. More satisfactory results are probably obtained if the injection is made in the morning with the stomach empty, omitting breakfast and lunch and tak-

ing roentgenograms four, eight and twenty-four hours after the injection. For gall-bladder visualization alone the drug is administered orally in the form of capsules or pills coated with phenyl salicylate; average dose, 5 Gm. administered in pills or capsules of 1 Gm. each during the evening meal. Breakfast is omitted. Since the capsules may not be dissolved, any abnormality found by the oral method should be checked up by the intravenous method. The liver function test cannot be made by this method because the dye is not absorbed rapidly enough into the blood.

To make the determination of liver function, blood is collected one-half hour and again preferably one hour after the intravenous injection. The serum is alkalized with a small drop of 5 per cent solution of sodium hydroxide and compared to a set of standard solutions as suggested by Rosenthal (An Improved Method for Using Phenoltetrachlorphthalein as a Liver Function Test, *J. Pharmacol. & Exper. Therap.*, 19, 385 (June 1922)) and modified by Cole, Copher and Graham (Simultaneous Cholecystography and Determination of Liver Function, *J. A. M. A.*, 90, 1111 (April 7, 1928)).

Phentetiothalein sodium occurs as bronze purple, odorless, slightly hygroscopic granules. It is soluble in water and alcohol.

Dissolve 1 Gm. of phentetiothalein sodium in water: a clear solution appears. Add diluted hydrochloric acid drop by drop to 1 cc. of a 10 per cent aqueous solution of phentetiothalein sodium: a yellow-colored precipitate appears. Add sodium hydroxide solution in large excess to 1 cc. of a 10 per cent aqueous solution of phentetiothalein sodium: a permanent purple color appears.

Intimately mix 0.1 Gm. of the salt with 1.0 Gm. of anhydrous sodium carbonate and heat to fusion; cool the mixture, dissolve in diluted hydrochloric acid and filter; add a few drops of hydrogen peroxide solution and agitate the mixture with a few cubic centimeters of chloroform: the chloroform layer is colored violet (*iodine*).

Transfer about 0.5 Gm., accurately weighed, of phentetiothalein sodium to a flat type weighing bottle and dry in a vacuum at 80 C. to constant weight: the loss in weight is not more than 5 per cent.

Transfer about 0.2 Gm., accurately weighed, of phentetiothalein sodium to a bomb tube; determine the iodine by the Carius method: the amount of iodine found is not less than 56 per cent nor more than 59 per cent when calculated to the dry basis.

**ISO-IODEIKON.**—A brand of phentetiothalein-N. N. R.

Manufactured by the Mallinckrodt Chemical Works, St. Louis. No U. S. patent or trade-mark.
*Iso-Iodeikon, 2.5 Gm. Ampoules.*

*Jour. A. M. A.*, Nov. 17, 1928.

## THE GLYN-JONES MEMORIAL.

A Glyn-Jones Memorial Committee has been organized of which Messrs. H. Skinner and H. N. Linstead are, respectively, chairman and secretary. Generous provisions have been made for Lady Glyn-Jones by the Proprietary Articles Trade Association and by the Pharmaceutical Society. The Fund to be provided of 10,000 pounds is intended for completing the education of the second son of the late Sir William Glyn-Jones and further, at the discretion of the Trustees, for the education of needy young persons, or orphans, or for the higher pharmaceutical education of approved persons.

Various drug trade associations are represented on the Committee and in their call to retailers, wholesalers and manufacturers the hope is expressed that all who have benefited by Sir William's work will contribute, and the purpose is to make the memorial worthy of the man and worthy of the organizations represented on the Committee. Subscriptions should be sent to 17 Bloomsbury Square (London, England—office of the British Pharmaceutical Society).

## WORLD WAR HISTORY IN PRESS CLIPPINGS.

A history of the World War in newspaper clippings has been acquired by the New York Historical Society with funds provided by John D. Rockefeller, Jr. The collection covers the period of the War, reported in news items and commented on in editorials. The clippings were gathered and assembled by Otto Spengler, of the Argus Press Clipping Bureau, and the material is mounted in 400 volumes of 200 pages each. While the greater number of clippings were gathered as above, the collection has been added to from a dozen or more sources by individuals, whose hobbies are represented in a good work, and may suggest to pharmacists opportunities for filing useful information and historical material for reference and preservation for those who follow.

The 400 volumes referred to are now in the rooms of the Historical Society at 170 Central Park West, and will be accessible to students and scholars who wish to consult them. So large is the collection that it quite fills the walls of an ordinary-sized room. Librarian Alexander J. Wall considers it an invaluable addition to the Society's documentary collection of history.

## GUIDE TO MUSEUM COLLECTIONS.

There has been a tremendous growth of museum collections of all kinds within recent years and there has been experienced a constantly increasing demand for information regarding both museums and their contents.

Ralph Clifton Smith, acting director of the American Association of Museums has said that data regarding museums should be made available, which would permit of the fullest utilization of the vast stores of material and at the same time assist those engaged in museum work to study the relations of individual institutions to museums as a whole. He said in part:

"A mass of material concerning every museum should be brought together and arranged in such a manner that the field could be viewed from a great variety of angles in an expeditious manner. No single museum would be justified in undertaking a work of this sort, yet every institution would doubtless be willing to coöperate. Its publication by a central agency, such as the American Association of Museums, would be feasible, and the demand for such a book promises to be sufficient to warrant the undertaking.

"The increase in the number as well as the size of American museums has made a knowledge of their collections far beyond the capacity of even a large group of persons. While a specialist in a single field may be informed regarding the location of all important material appertaining to his branch of science or art, it is often difficult to get into immediate communication with such a person, and many would be required in order to cover the entire field of modern museum effort. The value of summarizing the information possessed by those best qualified to interpret museums becomes apparent when we consider the advantages of using the material not of one museum but perhaps of a dozen or more.

"Very few museums have series of objects in any category which are not supplemented and amplified by the possessions of other institutions. The immediate knowledge of the whereabouts of all important accumulations covering a certain subject may be of inestimable value to an investigator. A published survey of the sort suggested would obviate in many cases the necessity for hurried and often cursory inquiries among a few museums selected more or less at random. Advantages would accrue not only to the public but museums would find themselves benefiting from the increased interest in and use of their collections.

"When museums as a group have available exact information as to their status with relation to the political divisions of the country, to population and to each other, more efficient administrative methods will be possible and certain duplications of effort will be revealed. Perhaps no greater need for information regarding the distribution, kinds of museums and means of support is felt than by the organizers of proposed institutions or the directors of small existing museums. With many duties of a highly diversified character often imposed upon a single person in the capacity of director, the need for tabloid information is keenly felt."

### DRUGGISTS' RESEARCH BUREAU ESTABLISHES MAILING LIST.

The directing committee of the Druggists' Research Bureau, A. Kiefer Mayer, chairman, has voted to establish a direct mailing list for members, either retail druggists or others, who contribute $2 a year for the expense of making addressograph name stencils and the expense of mailing, and that the bureau, at least once a month, mail some data of interest to those on this special mailing list.

The Bureau, however, will continue to mail free of charge its publications to drug trade journals, college deans and teachers of commercial pharmacy, association officers, manufacturers, wholesalers and their salesmen, and other individuals who are assisting in the work of the Bureau.

## PERSONAL AND NEWS ITEMS.

The scientific library of the late **William A. Hall**, of Detroit, has been given to the College of Pharmacy of the College of the City of Detroit. The library consists of books and original scientific papers, including many of historical interest. A section of the Pharmacy Library of the College has been reserved for the collection.

**John M. Danneker**, formerly instructor in Chemistry in the Pharmacy Department of Tulane University, was recently appointed City Chemist at New Orleans.

**William L. Cliffe** has been appointed director of the Philadelphia Wholesale Drug Company to fill the unexpired term of A. R. Hesske, who died on September 10th.

**Dr. F. G. Banting**, of the University of Toronto, gave the Cameron lecture at the University of Edinburgh on October 30th, giving an historical account of the researches that led to the discovery of insulin.

**Dr. Torald Sollmann**, professor of pharmacology at Western Reserve University, has

been appointed dean of the School of Medicine. Dr. Sollmann is well and favorably known to pharmacists and the announcement is pleasing.

**Eli Lilly** has given $1000 to New York University for the 1928–1929 Eli Lilly Scientific Research Fellowship, for a study of metabolism under the direction of Prof. Wyckoff and Drs. DuBois and Helmuth.

**M. Georges Vacasseur,** the new president of the General Association of French Pharmacists, has been nominated Chevalier of the Legion of Honor. He is Mayor of Sanvic, the little Norman town where he has a pharmacy.

The Surgeon-General, in reply to a letter of Chairman A. L. I. Winne, has informed the latter that there are no graduate pharmacists holding commissions as officers in the U. S. Army and now engaged in pharmaceutical dispensing in the military hospitals.

**Edward Francis,** of the United States Public Health Service, who isolated the tularaemia germ has been stricken with undulant fever. The fever was contracted in the laboratory while conducting further studies at the Hygienic Laboratory investigating the cause of the disease and cure in human subjects.

Representative **R. L. Reeder** from San Antonio will present a revised pharmacy law to the next session of the Texas Legislature for enactment, and he is asking the support of citizens for his measure. The bill would prevent the name "drug store" being used when a registered pharmacist is not in charge.

Johns Hopkins University School of Medicine is to have another laboratory building. It will be a five-story building, of which Dr. John J. Abel will occupy the third floor; the two upper floors will be assigned to the department of physiologic chemistry.

**Frank Oscar Cole,** of Jersey City, N. J., a veteran in pharmacy, was presented with a leather armchair by Gov. A. Harry Moore of New Jersey. The gift was provided by the Hudson County Retail Druggists' Association and the presentation ceremonies took place at Hotel Plaza, Jersey City, on November 21st, at which time more than two hundred members of New Jersey Pharmaceutical Association and their friends were present. Dean Ernest Little spoke on the "Need of Pharmacy To-Day" and pointed to Mr. Cole as an exemplary of the type of men wanted in pharmacy. Governor Moore spoke of the impress of Mr. Cole, declaring that his activities as soldier, legislator and leader in his profession made him an inspiration to others.

Mr. Cole is in his 83rd year; he entered the drug business sixty years ago and retired in 1921.

Edwin G. Boring, son of our late fellow-member, **Edwin McC. Boring,** of Philadelphia, is President of the American Psychological Association. President Boring is a member of the Harvard Faculty.

A pharmacist, writing to a member and commenting on a contributed article says: "It appears to me that each and every pharmacist should belong to such a body of men as the AMERICAN PHARMACEUTICAL ASSOCIATION apparently is, an association that publishes information of this type and character. Therefore, if you will be kind enough to include in your reply the *modus operandi* I will take steps at once to have my name enrolled if such a procedure is possible. The letter pleases us and, therefore, this reprint of part of the communication, which was mailed to us without comment.

Members will be pleased to learn that Senator-Elect Thomas Connally, of Texas, is a cousin and friend of Walter H. Cousins, Editor of the *Southern Pharmaceutical Journal.* The relationship presents a point of contact for worthy propositions; too often this has been lacking in the promotion of important legislation, which has not been understood, or misunderstood.

Mr. Justice Holmes, in his opinion on the Pennsylvania Ownership Law, stated the following fact,[1] among others: "a standing criticism of the use of corporations in business is that it causes such business to be owned by people who do not know anything about it. Argument has not been supposed to be necessary in order to show that the divorce between the power of control and knowledge is an evil." "The selling of drugs and poisons calls for knowledge in a high degree." A licensed pharmacist "would be more likely to observe the business with an intelligent eye than a casual investor who looked only to the standing of the stock in the market."

Commissioner Abram F. Meyers has been named chairman of the Federal Trade Commission; he will assume office December 1st and will succeed Commissioner William E. Humphrey, who has served as chairman one year. Mr. Myers was elected in accordance

[1] The quoted words.

with the commission rule providing that the five members serve in rotation as chairman for one year.

A Research Division has been established at the N. W. D. A. Headquarters, under the direction of H. J. Ostlund of the School of Business, University of Minnesota. He will be located in the New York office of the N. W. D. A. after January 1st. He has had large experience in work of this kind and several years ago made a study of the financial statements of about 600 drug stores. He has also done constructive work in originating and preparing a budget system for retail druggists in building up a successful business and also in various other fields of industry. Professor Ostlund has just completed work for the Ph.D. degree at the school of business of the University of Chicago.

The Hoffmann-LaRoche Chemical Company has broken ground at Nutley, N. J., for its new scientific and office buildings, including laboratories. It is expected that the buildings will be completed by May 1st. The formalities of breaking ground were participated in by Mrs. Elizabeth Hoffmann, widow of the founder of the company, and Dr. Emil Barell, the president of the American company and director of the LaRoche activities in Europe.

## OBITUARY.

### GUS C. KENDALL.

Gus C. Kendall, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1913, died at his home in Meridian, Miss., November 2nd, aged sixty years. Mr. Kendall was born in Attala, Miss., the son of Dr. William T. and Sarah Wyse Kendall. He came to Meridian as a young man and established a drug business in which he continued until his death.

The tributes paid the deceased express the high esteem in which he was held by the community in which Mr. Kendall had resided for many years. All business and social organizations of Meridian were represented at the funeral services. We quote a tribute, from one of many, in the local press.

"In a growing community he was one of the moving spirits of progress. During his entire residence in Meridian there was never a time when a civic problem was up for consideration that he did not have and promote a conviction, a conviction born of cautious consideration and mature judgment. The wise counsel of this good man has aided in solving many of these problems and we have heard many say that Gus Kendall always was on the side of that which was good and for which good men stood. He was not one who aspired to leadership, but preferred modestly to work in the ranks giving unstintingly of his time and strength. Not a captain, but an armor bearer, dependable at all times."

Mr. and Mrs. Kendall (nee Watts) were married in 1893. The widow, a son, Sam W., and a daughter, Mrs. Sadie Kendall Knight, survive the deceased. We are indebted to Mr. Knight for data for this notice and desire to express sympathy to the bereaved family.

### WILLIAM PEARCE THOMASON.

We are advised of the death of William P. Thomason, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1910. A sketch of the deceased will be found in the Department of the National Association of Boards of Pharmacy of this issue. Mr. Thomason attended a number of the annual meetings of the A. PH. A. He was an active supporter of pharmaceutical associations and deeply interested in whatever advanced pharmacy and the drug business.

### CHARLES S. KOON.

We are also advised of the passing of Charles S. Koon, of Muskegon, Mich.; in the absence of more extended information further report will have to be deferred. A brief notice is given in the Department N. A. B. P. Mr. Koon became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1915.

### HENRY ELLIOTT HOLMES.

Brief mention was made in the November number of the JOURNAL OF THE A. PH. A. of the passing of Henry Elliott Holmes of Seattle, a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1880. He was a native of Wisconsin, and Palmyra his birth-place; here he lived until 1873 when he settled in Walla Walla, Washington. In 1877 he was member of a company of volunteers who joined General O. O. Howard in his Indian campaign in the Nez Perce country. In 1888

he entered into partnership with A. B. Stewart of Seattle and Morley Stewart of Tacoma, under the firm name of Stewart & Holmes. For a number of years this firm conducted retail drug stores in Seattle, Tacoma and Walla Walla, but since 1904 the company has operated a wholesale drug business in Seattle.

Mr. Holmes was a veteran in Oddfellowship and held many offices in the order, locally and of the state.

Last year Mr. and Mrs. Holmes celebrated their golden wedding anniversary; on August 2nd of this year the latter died and the husband followed her into the Great Beyond October 26th; a son and four daughters survive the deceased.

Mr. Holmes was highly regarded and esteemed by his fellows, both as citizen and pharmacist and the ASSOCIATION extends sympathy to the bereaved.

**Secretary Otto Kraus**, of the Philadelphia Retail Druggists' Association, died November 6th, aged 74 years. He graduated from the Philadelphia College of Pharmacy in 1875 and for many years conducted a retail pharmacy; in 1919, he was elected Secretary of the P. A. R. D. He was a trustee of his *Alma Mater*. The deceased is survived by his widow and a son.

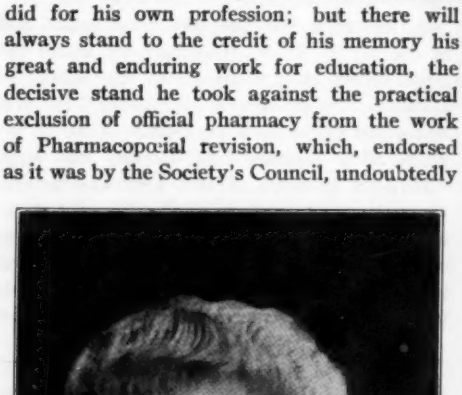
**Miss Susannah G. Haydock**, the first woman to own and operate a drug store in Philadelphia, which she conducted for thirty-five years, died October 9th, in Cincinnati. She was returning home from San Francisco where she attended the N. A. R. D. convention, and had stopped in Cincinnati to visit friends. She was a graduate of the Philadelphia College of Pharmacy; following her graduation, she joined the faculty of Temple University as an instructor in pharmacy, resigning in 1908.

Sympathy is expressed to the families of the deceased.

## EDMUND WHITE.

There was some surprise expressed when, about a year ago, Mr. Edmund White asked to be relieved of some of his duties in connection with British pharmacy and pharmacopœial work; the news of his passing, on November 3rd, gave the answer and brought sorrow not only to his fellow-pharmacists and co-workers in England, but a touch of sadness and regret to American pharmacists who had followed his work for a number of years.

The Editor of *The Pharmaceutical Journal and Pharmacist* said of him: "It is impossible at this stage to sum up all that he was and did for his own profession; but there will always stand to the credit of his memory his great and enduring work for education, the decisive stand he took against the practical exclusion of official pharmacy from the work of Pharmacopœial revision, which, endorsed as it was by the Society's Council, undoubtedly



EDMUND WHITE.

precipitated the reorganization of the machinery for this purpose, of which pharmacy now forms an integral part; his friendly and fruitful offices in promoting and establishing closer working relations with Continental and American pharmacy, and, lastly, his initiative and instrumentality in the institution of the Society's Pharmacological Laboratories."

No attempt will be made to sketch the life of this distinguished pharmacist, for it would require columns to give an account of the activities of Mr. White. He entered the Society's School as a Senior Bell scholar, in 1886, winning the honors and medals of his classes. After qualification he remained in the School for a year as a demonstrator and during that year passed the examination for

the Associateship of the Institute of Chemistry. In 1889 he was appointed pharmaceutist to St. Thomas's Hospital, an appointment he held until 1903 when he joined the staff of Hopkins and Williams, of which he later became a director. In the meantime he had taken the fellowship of the Institute of Chemistry and the B.Sc. degree of the University of London of the first class honors in Chemistry. His official connections with the British Pharmaceutical Society included among others of importance that of Councillor, Vice-President and President. In 1903, he entered upon a term of six years as Honorary Joint General Secretary of the British Pharmaceutical Conference of which he was the Chairman in 1923. He was author of a book on "Chemical Reagents," co-author with John Humphrey of "Pharmacopœdia," member of the Committee on B. P. Codex, which carried out the experimental part, and his active connection with the revision of the British Pharmacopœia is well known here.

Former Secretary of the British Pharmaceutical Society, W. J. U. Woolcock said of him, "He was a tower of strength, his profound knowledge was invaluable, but of greater value still was the spirit he enthused into members of his Committee."

President D. Lloyd Howard, in writing of him, stated that it was difficult to write of Edmund White without a measure of eulogy which he would himself have detested, for through all his other qualities shown a tried and delightful humor which never tolerated excess of praise or blame.

We close with a quotation from former President Neathercoat's tribute, because it gives an exemplary view that alumni everywhere might follow with credit to themselves:

"He has been one of the outstanding figures in pharmaceutical history during the last twenty-five years, and he should be looked upon as one of the greatest leaders the Pharmaceutical Society has probably ever had. He was one of the students of the Society's School of Pharmacy, and I know that he always considered that it was an obligation and a duty on those who had passed through the School and received the advantages accruing therefrom that they should in afterlife do what they could to serve the Pharmaceutical Society in return for the benefits received while in the School."

**Sir Nestor Isidore Charles Tirard** died at his home in London on November 10th, aged seventy-five years. It is striking that the news of the death of Edmund White and Sir Nestor is reported in the same number of the JOURNAL. His name was familiar to pharmacists chiefly through his joint editorship (with Prof. H. G. Greenish) of the British Pharmacopœia, 1914. He was also secretary to the Pharmacopœia Committee of the General Medical Council in connection with the 1898 Pharmacopœia, and a member of the Board of Trade Committee appointed in that year to revise the scales of medicines for merchant ships.

The death is announced, at the age of 81, of Prof. Albert Robin, of the Paris Faculty; he was in his younger days preparateur to Thenard.

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## LEGAL AND LEGISLATIVE.

### THE PENNSYLVANIA DRUG STORE OWNERSHIP LAW DECLARED UNCONSTITUTIONAL IN DECISION OF U. S. SUPREME COURT.

On account of the importance of the decision by which the Pennsylvania Ownership Law was declared unconstitutional—the law is printed herewith, and also the decision and the dissenting opinion. Liberty is taken in printing parts of the decision in italics. It is believed that the law, decision and dissent should be on record for future reference.

THE PENNSYLVANIA OWNERSHIP LAW.

*Section 1.*—Every pharmacy or drug store shall be owned only by a licensed pharmacist, and no corporation, association or co-partnership shall own a pharmacy or drug store, unless all the partners or members thereof are licensed pharmacists; except that any corporation organized and existing under the laws of the Commonwealth of any other state of the United States, and authorized to do business in the Commonwealth, and empowered by its charter to own and conduct pharmacies, or drug stores, and any association or co-partnership which, at the time of the passage of this act, still owns and conducts a registered pharmacy or pharmacies or a drug store or drug stores in the Commonwealth, may continue to own and conduct the same; but no other or additional pharmacies or drug stores shall be

established, owned or conducted by such corporation, association or co-partnership, unless all the members or partners thereof are registered pharmacists; but any such corporation, association or co-partnership, which shall not continue to own at least one of the pharmacies or drug stores theretofore owned by it, or ceases to be actively engaged in the conduct of a pharmacy, shall not be permitted thereafter to own a pharmacy or a drug store, unless all of its partners or members are registered pharmacists; and except that any person, not a licensed pharmacist, who, at the time of the passage of this act, owns a pharmacy or a drug store in the Commonwealth may continue to own and conduct the same, but shall not establish or own any additional pharmacy or drug store, or if he or she ceases to operate such pharmacy or drug store, shall not thereafter own a pharmacy or drug store, unless he or she be a registered pharmacist; and except that the administrator, executor or trustee of the estate of any deceased owner of a registered pharmacy or drug store, may continue to own and conduct such pharmacy or drug store during the period necessary for the settlement of the estate: Provided, that nothing in this section shall be construed to prevent or affect the ownership, by other than a registered pharmacist, of a store or stores wherein the sale or manufacture of drugs or medicines is limited to proprietary medicines and commonly used household drugs, provided such commonly used household drugs are offered for sale or sold in packages which have been put up ready for sale to consumers by pharmacists, manufacturing pharmacists, wholesale grocers or wholesale druggists.

*Section 2.*—Any person, co-partnership or corporation, violating the provisions of this act, shall be guilty of a misdemeanor and, upon conviction thereof, shall be sentenced to pay a fine of not more than $100. Each day any such pharmacy is owned contrary to the provisions of this act shall be considered a separate offense.

THE DECISION.

The decision was delivered by Mr. Justice Sutherland; it follows:

"The act provides that every pharmacy or drug store shall be owned only by a licensed pharmacist, and, in the case of corporations, associations and co-partnerships, requires that all the partners or members thereof shall be licensed pharmacists, with the exception that such corporations as are already organized and existing and duly authorized and empowered to do business in the state and own and conduct drug stores or pharmacies, and associations and partnerships, which, at the time of the passage of the act, still own and conduct drug stores or pharmacies, may continue to own and conduct the same.

"The appellant is a Massachusetts corporation authorized to do business in Pennsylvania. At the time of the passage of the act, appellant was empowered to own and conduct and owned and thereafter continued to own and operate a number of pharmacies or drug stores at various places within the latter state.

"After the passage of the act, appellant purchased and took possession of two additional drug stores in that state and carried on and continues and intends to continue to carry on a retail drug business therein under the title of 'drug store' or 'pharmacy,' including the compounding, dispensing, preparation and sale at retail of drugs, medicines, etc.

"The business was and is carried on through pharmacists employed by appellant and duly registered in accordance with the statutes of the state. All of the members (stockholders) of the appellant corporation are not registered pharmacists, and, in accordance with the provisions of the act, the Pennsylvania State Board of Pharmacy has refused to grant appellant a permit to carry on the business.

"It further appears that the State Attorney General and the District Attorney of the proper county have threatened and intend to and will prosecute appellant for its violation of the act, the penalties for which are severe and cumulative. Suit was brought to enjoin these officers from putting into effect their threats, upon the ground that the act in question contravenes the due process and equal protection clauses of the Fourteenth Amendment.

"It is clear from the pleadings and the record, and it is conceded, that if the act be unconstitutional as claimed, appellant is entitled to the relief prayed. Terrace *vs.* Thompson, 263 U. S. 197, 215; Ex Parte Young, 209 U. S. 123.

"The court below, composed of three judges, heard the case upon the pleadings, affidavits and an agreed statement of facts, and rendered a decree denying a preliminary injunction and, upon the agreed submission of the case, a final decree dismissing the bill for want of equity. 22 F. (2d) 993. The statute was

held constitutional upon the ground that there was a substantial relation to the public interest in the ownership of a drug store where prescriptions were compounded.

"In support of this conclusion, the court said that medicines must be in the store before they can be dispensed; that what is there is dictated not by the judgment of the pharmacist but by those who have the financial control of the business; that the legislature may have thought that a corporate owner in purchasing drugs might give greater regard to price than to quality, and that if such was the thought of the legislature the court would not undertake to say that it was without a valid connection with the public interest and so unreasonable as to render the statute invalid."

PROPERTY RIGHTS ENTITLED TO PROTECTION.

"That appellant's business is a property right, Duplex Co. *vs.* Deering, 254 U. S. 443, 465; Truax *vs.* Corrigan, 257 U. S. 312, 327, and as such entitled to protection against state legislation in contravention of the Federal Constitution, is, of course, clear.

"That a corporation is a 'person' within the meaning of the due process and equal protection clauses of the Fourteenth Amendment, and that a foreign corporation permitted to do business in a state may not be subjected to state statutes in conflict with the Federal Constitution, is equally well settled. Kentucky Co. *vs.* Paramount Exch., 262 U. S. 544, 550; Power Co. *vs.* Saunders, 274 U. S. 490, 493, 496–497; Frost Trucking Co. *vs.* R. R. Com., 271 U. S. 583, 594 *et seq.*

"And, unless justified as a valid exercise of the police power, the act assailed must be declared unconstitutional because the enforcement thereof will deprive appellant of its property without due process of law.

"The act is sought to be sustained specifically upon the ground that it is reasonably calculated to promote the public health; and the determination we are called upon to make is whether the act has a real and substantial relation to that end or is a clear and arbitrary invasion of appellant's property rights guaranteed by the Constitution. See Adair *vs.* United States, 208 U. S. 161, 173–174; Mugler *vs.* Kansas, 123 U. S. 623, 661.

"The police power may be exerted in the form of state legislation where otherwise the effect may be to invade rights guaranteed by the Fourteenth Amendment only when such legislation bears a real and substantial relation to the public health, safety, morals or some other phase of the general welfare. Here the pertinent question is: What is the effect of mere ownership of a drug store in respect of the public health?"

(*What Does "Charge" Imply? Who Must Be in Charge?*)

"*A state undoubtedly may regulate the prescription, compounding of prescriptions, purchase and sale of medicines, by appropriate legislation to the extent reasonably necessary to protect the public health.* And this the Pennsylvania legislature sought to do by various statutory provisions in force long before the enactment of the statute under review.

"Briefly stated, these provisions are: No one but a licensed physician may practice medicine or prescribe remedies for sickness (Pa. St. 1290, Section 16779); *no one but a registered pharmacist lawfully may have charge of a drug store* (Pa. St. 1920, Sections 9323, 9327); *every drug store must itself be registered, and this can be only done where the management is in charge of a registered pharmacist* (Pa. St. Supp. 1928, Section 9329a-2); stringent provision is made to prevent the possession or sale of any impure drug or any below the standard, strength, quality and purity as determined by the recognized pharmacopœia of the United States (Pa. St. 1920, Section 9337; Pa. St. Supp. 1928, Section 9339); *none but a registered pharmacist is permitted to compound physicians' prescriptions* (Pa. St. 1920, Sections 9317, 9323); and, finally, *the supervision of the foregoing matters and the enforcement of the laws in respect thereof are in the hands of the State Board of Pharmacy, which is given broad powers for these purposes.*

"It, therefore, will be seen that without violating laws, *the validity of which is conceded*, the owner of a drug store, whether a registered pharmacist or not, cannot purchase or dispense impure or inferior medicines; he cannot, unless he be a licensed physician, prescribe for the sick; he cannot unless he be a registered pharmacist, have *charge* of a drug store or compound a prescription. *Thus, it would seem, every point at which the public health is likely to be injuriously affected by the act of the owner in buying, compounding or selling drugs and medicines is amply safeguarded.*"

CONSTITUTIONAL RIGHT DENIED BY STATE LAW.

"The act under review does not deal with any of the things covered by the prior statutes above enumerated. It deals in terms only with ownership. It plainly forbids the exercise of an ordinary property right and, on its face, denies what the Constitution guarantees.

"A state cannot, 'under the guise of protecting the public, arbitrarily interfere with private business or prohibit lawful occupations or impose unreasonable and unnecessary restrictions upon them.' Burns Baking Co. *vs.* Bryan, 264 U. S. 504, 513. See also Meyer *vs.* Nebraska, 262 U. S. 390, 399–400; Norfolk Ry. *vs.* Public Serv. Comm., 265 U. S. 70, 74; Pierce *vs.* Society of Sisters, 268 U. S. 510, 534–535; Weaver *vs.* Palmer Bros. Co., 270 U. S. 402, 412–415; Fairmont Co. *vs.* Minnesota, 274 U. S. 1, 9–11.

"In the light of the various requirements of the Pennsylvania statutes, it is made clear, if it were otherwise doubtful, that mere stock ownership in a corporation, owning and operating a drug store, can have no real or substantial relation to the public health; and that the act in question creates an unreasonable and unnecessary restriction upon private business.

"No facts are presented by the record, and, so far as appears, none were presented to the legislature which enacted the statute, that properly could give rise to a different conclusion.

"It is a matter of public notoriety that chain drug stores in great numbers, owned and operated by corporations, are to be found throughout the United States. They have been in operation for many years. We take judicial notice of the fact that the stock in these corporations is bought and sold upon the various stock exchanges of the country and, in the nature of things, must be held and owned to a large extent by persons who are not registered pharmacists.

"If detriment to the public health thereby has resulted or is threatened, some evidence of it ought to be forthcoming. None has been produced, and, so far as we are informed either by the record or outside of it, none exists.

"The claim, that mere ownership of a drug store by one not a pharmacist bears a reasonable relation to the public health, finally rests upon conjecture, unsupported by anything of substance. This is not enough; and it becomes our duty to declare the act assailed to be unconstitutional as in contravention of the due process clause of the Fourteenth Amendment. Decree reversed."

November 19, 1928.

THE DISSENTING OPINION.

The full text of the dissenting opinion of Mr. Justice Holmes, in which Mr. Justice Brandeis joined, follows:

"A standing criticism of the use of corporations in business is that it causes such business to be owned by people who do not know anything about it.

"Argument has not been supposed to be necessary in order to show that the divorce between the power of control and knowledge is an evil. The selling of drugs and poisons calls for knowledge in a high degree, and Pennsylvania after enacting a series of other safeguards has provided that in that matter the divorce shall not be allowed.

"Of course, notwithstanding the requirement that in corporations hereafter formed all the stockholders shall be licensed pharmacists, it still would be possible for a stockholder to content himself with drawing dividends and to take no hand in the company's affairs. But obviously he would be more likely to observe the business with an intelligent eye than a casual investor who looked only to the standing of the stock in the market.

"The Constitution does not make it a condition of preventive legislation that it should work a perfect cure. It is enough if the questioned act has a manifest tendency to cure or at least to make the evil less.

"It has been recognized by the professions, by statutes and by decisions that a corporation offering professional services is not placed beyond legislative control by the fact that all the services in question are rendered by qualified members of the profession. See People *vs.* Title Guaranty & Trust Co., 227 N. Y. 366; Tucker *vs.* New York State Board of Pharmacy. 217 N. Y. Supp. 217, 220. Matter of Cooperative Law Co., 198 N. Y. 479. People *vs.* Merchants' Protective Corporation, 189 Cal. 531. New Jersey Photo Engraving Co. *vs.* Carl Schonert & Sons, 95 N. J. Eq. 12. Hodgen *vs.* Commonwealth, 142 Ky. 722.

"But for decisions to which I bow I should not think any conciliatory phrase necessary to justify what seems to me one of the incidents of legislative power. I think, however, that the police power as that term has been defined and explained clearly extends to a law

like this, whatever I may think of its wisdom and that the decree should be affirmed.

"Of course, the appellant cannot complain of the exception in its favor that allows it to continue to own and conduct the drug stores that it now owns. The Fourteenth Amendment does not forbid statutes and statutory changes to have a beginning and thus to discriminate between the rights of an earlier and those of a later time. Sperry & Hutchinson Co. *vs.* Rhodes, 220 U. S. 502, 505."

## BOOK NOTICES AND REVIEWS.

*Food and Drug Laws—Federal and State.* By CHARLES WESLEY DUNN, ESQ., Publishers, United States Corporation Company, 150 Broadway, New York City. Three volumes, 4193 pages. Price $50.00.

The author is a member of the New York Bar, General Counsel for the organized American Food and Pharmaceutical Manufacturers, represented by the American Grocery Specialty Manufacturers' Association and the American Pharmaceutical Manufacturers' Association. General Counsel also for the National Association of Retail Grocers, various food, toilet and pharmaceutical manufacturers. These connections have contributed to information that has been brought together in these volumes, and arranged for reference.

*Part 1* of Volume 1 contains the Federal Food and Drugs Act and includes: The act with amendments; the statutory provisions creating the Food, Drug and Insecticide Administration for the administration of the act, etc., and also making the annual appropriation therefor; the miscellaneous statutory provisions; the miscellaneous general food and drug laws, in addition to the act; a complete analytical statement of the court cases reported under the act; the general rules and regulations promulgated under the act; the effective food inspection decisions published under the act; the effective definitions and standards for food products published for use in administering the act; regulatory announcements upon foods and drugs; miscellaneous informative statements.

*Part 2* is largely concerned with food laws and regulations.

*Part 3* includes the following: Abortifacient and contraceptive laws and all postal regulations and reported cases thereunder; caustic poison act; insecticide and fungicide act and regulations, decisions, regulatory announcements and reported cases thereunder; Harrison narcotic act and reported cases thereunder; narcotic drugs import and export act and all reported cases thereunder; manufacture of smoking opium act and Chinese imported opium act; biologic products acts and all regulations and reported cases thereunder; mailing of poisons law and all postal regulations and reported cases thereunder; pharmacy, poison and narcotic act for the United States consular districts in China; venereal diseases control law; 18th amendment to Constitution of the United States; national prohibition act and acts supplementary thereto and reported cases decided by Supreme Court thereunder; tariff act (dutiable and free lists, to the extent they are pertinent).

*Part 4* considers among items Red Cross insignia law, Lottery law, Commerce protection law, Trade-mark law, Weights and Measures laws and all cases reported thereunder.

*Parts 1* and *2* of Volumes II and III are concerned with general state food and drug laws and special state food laws.

*Parts 3* and *4* give consideration to: Alcohol laws; antiseptic and disinfectant laws; biologic products laws; distribution of samples laws; embalming fluid laws; insecticide and fungicide laws; narcotic laws; pharmacy laws; poison laws; prohibition laws including those relative to Jamaica ginger; stock and poultry remedy laws; toilet preparation laws; wood alcohol laws; false advertising laws; flag desecration law; soap laws; tobacco and tobacco product laws; trade-mark and container protection laws; trading stamp laws; weights and measures laws.

*Part 5* reports cases under above laws, cases involving civil action to recover damages for alleged injury resulting from consumption or use of product.

The matter contained in these volumes makes the work useful for manufacturers, wholesalers, lawyers, pharmacy board and faculty members, who require such information in the discharge of their duties.

*The Opium Problem.* By CHARLES E. TERRY, M.D., AND MILDRED PELLENS for The Committee on Drug Addictions in collaboration with the Bureau of Hygiene, Inc., 370 Seventh

Ave., New York, pp. 1042 + XVI. Cloth. Price $5.00.

"The Committee on Drug Addictions is a group consisting of the following individuals: Katharine Bement Davis, Ph.D., General Secretary, Bureau of Social Hygiene, *Chairman;* Stanley Cobb, M.D., Professor of Neuropathology, Harvard University Medical School; Lafayette B. Mendel, Ph.D., Sc.D., Professor of Physiological Chemistry, Yale University; A. N. Richards, Ph.D., Sc.D., Professor of Pharmacology, University of Pennsylvania; Willard S. Richardson, Secretary, Laura Spelman Rockefeller Memorial; William F. Snow, M.D., General Director, American Social Hygiene Association; George B. Wallace, M.D., Professor of Pharmacology, New York University and Bellevue Hospital Medical College. The studies pursued by the Committee have been carried on by Charles E. Terry, M.D., *Executive,* and Mildred Pellens, *Associate Executive.*"

These preliminary statements are made to inform the reader so that he may judge to a certain extent the value of the records. The given data point out the compilers as reliable, and seriously engaged in gaining information with a purpose of aiding in checking the misuse of narcotics. This information is important, because it is not difficult to enlist the sympathy of the public in matters of this kind and, hence, it presents a field of opportunity for those who seek the lime-light by presenting a magnified or distorted picture of a condition which at best is distressing and at its worst constitutes a serious menace. As far back as a quarter of a century ago narcotic habituation was studied by organizations of the medical and pharmaceutical professions in order to check addiction, which seemingly or actually was getting a hold on a large and growing number. Some of these early contributors to reports were, at times, influenced by what they expected to find and the pitiful conditions which they had observed, and by hearsay. The alarm created by the increased use of narcotics found expression in sections of the press in which the interest of readers is sought and any other result is more or less secondary. The writer recalls his expectancy to have facts and figures of a far greater significance than could be substantiated. Organizations to check the addiction were the results of overdrawn statements as well as of actual conditions and, probably, there were some who took advantage of public interest for personal gain.

More reliable facts and figures on the extent of addiction are obtainable than formerly, but to some extent these must be based on individual statements; however, the study of habituation now has a greater value because the progress of addiction can be quite definitely determined by clinical observation, and the number of addicts checked with far greater accuracy.

The writer desires to bring the name of Dr. James H. Beal into the records and to list among the publications the "PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION," so as to have these references added to the beginnings of legislation which led to the Harrison antinarcotic law.

On page 567, of Volume 50 of the "PROCEEDINGS A. PH. A., Chairman H. P. Hynson's report will be found and this really gave the impetus to continue the study of addiction by the ASSOCIATION; the foregoing was supported by an article on "Narcotics and the Habitués," printed on page 635 of the same volume. In Volume 51 is another report of the Committee (page 466) and a paper by James H. Beal—"An Antinarcotic Law"—which may be designated as a step toward national legislation relative to the handling of narcotics, for at the same meeting a draft for an antinarcotic law was submitted and a revision of it at the 1904 meeting (p. 104) at which time also a paper on "Pharmaceutical Legislation with Special Reference to Anti-Narcotic laws (page 180) was presented. The report made by Secretary W. L. Cliffe at the 1905 meeting indicates how seriously the conditions were viewed by pharmacists throughout the country. Here a statement may be introduced to the effect that no group has more persistently and consistently advocated regulations for controlling the sale of narcotics to safeguard public health than have pharmacists, and officials have stated on different occasions that pharmacists have not given them trouble, but the best of coöperation.

In the opinion of the writer the number of narcotic addicts is growing less; that is, users of the narcotics listed in legislative enactments; however, the traffic can only be kept in check by honest and faithful officials, and constant vigilance is necessary for the prevention of misuse of new products having such or related effect. It is therefore in the interest of the public that the sale and dispensing of all medicines be restricted to those who because of training and education know the effect of medicines and realize their individual respon-

sibility, as professional men and women, in safeguarding the public.

"The Opium Problem" is comprehensive and of value to every library, because information on the subject of addiction is sought, at times, in every city, by lawyers, legislators, physicians, pharmacists, teachers and students. The subject is treated under the following divisions: Extent of Addiction, Development of the Problem, Etiology, General Nature; Pathology —Somatic and Psychic Changes, Tolerance, Dependence, Withdrawal; Symptomatology, Types of Users, Treatment; Control—International, National, State, Municipal, Miscellaneous Suggestions, and concluded with a Bibliography and an Index.

It might be added here that "The Compilation of Food and Drug Laws" by the Proprietary Association, and "Dunn's Food and Drug Laws" are additional sources of information on laws and regulations that apply to the manufacture, sale and dispensing of narcotics.

*Handbuch der Biologischen Arbeitsmethoden*, "Handbook of Biological Methods."—Edited by PROF. DR. EMIL ABDERHALDEN. Section 259. Price 5 marks. "Preliminary Biological Examination of Unknown Drugs." By JOHN GRONBERG-HELSINGFORS. Urban & Schwarzenberg. 1928.

This interesting pamphlet comprising some ninety pages deals broadly with some of the methods employed by the pharmacologist, using the term again in the broad sense of the word, in starting an investigation of an unknown substance or chemical from the pharmacological or toxicological point of view. The book is by no means complete but has some interesting information on a few select topics. The methods here described are often somewhat antiquated and some of them have been supplanted by more accurate and useful forms of experimentation. The chief value of this essay consists in some of the original technic employed by the author John Gronberg and useful information may be gleaned also from some experimental data adduced by that writer. The beginner or tyro in pharmacological investigation will find this monograph of considerable interest and usefulness in some respects. Thus for instance a good deal of space is devoted to a description of methods employed by the author in investigating narcotic and hypnotic drugs and the same may be said of anthelmintic drugs. On the other hand the chapter devoted to examination of antiseptics is very elementary and the same may be said of the section on purgatives. The monograph is certainly not very comprehensive or well balanced. It is evident that the writer has expatiated chiefly concerning the drugs with which he has been personally engaged. That is, however, not the purpose of a handbook for biological methods. D. I. M.

*Handbuch der Biologischen Arbeitsmethoden*, "Handbook of Biological Methods."—Edited by PROF. DR. EMIL ABDERHALDEN. Section 251. Price 7 marks. "List of Toxic and Lethal Doses of Some Poisons." By F. FLURY and FRANZ ZERNIK-WURZBURG. Urban & Schwarzenberg. 1928.

This section of the well-known handbook on methods edited by Abderhalden comprises some one hundred and thirty pages and consists almost entirely of tables giving the toxic and lethal doses of different drugs and various animals. The material herein collected is not an original one but is the result of an extensive search through the literature. The tables indicate the authors whose figures are quoted and also give the more important literary references. This book will be found useful by the pharmacologist using the term in the broad sense of the word as defined by the reviewer elsewhere in this journal and also by toxicologists. The information here found will be used by the scientist with a grain of salt because every pharmacologist is quite aware that the question of dosage is not a hard and fast one especially in connection with animal experimentation and will be more or less modified by various conditions. The book contains information concerning drugs which are not very familiar to many physicians, and on the other hand all information concerning other compounds in which a research man may be interested will often be lacking. Thus, for instance, one can find here figures concerning the toxicity of cobra venom, cicutoxin, euphorin and yet there is a deplorable lack of available information, for instance, concerning many of the newer organic mercurials. German synthetics are found here in abundance but well-known drugs of foreign origin are often found missing. Altogether the book, however, will be a useful one to have on the shelves of the specialist in pharmacology and toxicology. D. I. M.

*Chemistry in Medicine*. A coöperative treatise intended to give examples of progress made

in medicine with the aid of chemistry. Edited by Julius Stieglitz, professor of chemistry, University of Chicago. Advisory Editors: Anton J. Carlson, professor of physiology; Frank R. Lillie, professor of zoölogy; H. Gideon Wells, professor of pathology, all of the University of Chicago and Reid Hunt, professor of pharmacology, Harvard Medical School, and Lafayette B. Mendel, professor of physiological chemistry, Yale University. 12 mo., 757 + XX pages, limp, $2.00. Publishers, The Chemical Foundation, Inc., New York City.

The foreword informs that the impetus which has led to the preparation of the book had its origin some years ago in the loss by death of Patricia daughter of Mr. and Mrs. Francis P. Garvin. In memory of their daughter the latter have made provisions for aiding in the establishment of independent and self-sufficient American Chemical Industries, of a better understanding of the possibilities and purposes of chemistry, to foster school, college and postgraduate education in Chemistry, to advance the cause of adequate American research facilities and, through the agency of scientific societies and universities, of chemical literature and chemical laboratories. The purposes of these endeavors are expressed in The Chemical Foundation which is dedicated to the protection of children and adults against avoidable disease and death.

The titles of the chapters indicate the aims of the Foundation: "The Significance of Chemistry and of Its Methods of Attack on Fundamental Problems," "The Human Body as a Machine," "The Story of the Discovery of the Vitamins," "The Conquest of Dietary Diseases," "Chemical Regulators of the Body," "The Policing of Civic Life in the Laboratory," "The Alleviation of Suffering," "The War of Invading Germs," "A Hope of Mankind—Chemotherapy." These divisions are subdivided with accompanying discussions; for example, Chapter IX on "The War on Invading Germs" considers the main subject under *The Germ Theory of Disease, Immunity—the Chemical Warfare of Existence, The Fight against Pus Organisms, The Battle against Malaria, The Advance against Amebic Dysentery, The Hope of the Leper, War on the Hookworm, Combat against Syphilis, Battle against Tuberculosis.*

In connection with this chapter it is interesting to note the recent announcement of the cure of John Early, the leper, who on a number of occasions brought fear to localities visited by him and serious interference on the part of friends. Dr. Adams, in the discussion of "the hope of the leper," states: "The result of these medical and chemical studies is that for every leper effectively treated eight years ago, probably 100 are effectively treated to-day."

*Pocket Medical Dictionary.* By GOULD. Ninth edition, 40,000 words, pronounced and defined. Contains a Dose-List for physicians, and a Veterinary Dose-List. Revised in accordance with the U. S. Pharmacopœia X. Flexible Binding, $2.00. Thumb Index, $2.50. Publishers, P. Blakiston's Son & Co., Philadelphia.

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The writer suggests that definitions of official drugs, chemicals and preparations, both of the U. S. Pharmacopœia and National Formulary, be given in conformity with these standards; necessarily, this must, in some instances, be in condensed form and most of the U. S. P. drugs are considered in that way, but the same consideration should be given to the National Formulary. This means, of course, that mention should also be made of the National Formulary under the copyright statement. The names of the official drugs of the National Formulary are given, but these definitions do not conform with that standard. Citing a few, the official title of *Cocillana Bar.* is **Cocillana.** *Convallaria majalis* is given in the Dictionary, it should be **Convallariæ Radix. Gossypium** is given in the Dictionary—the official U. S. P. item is **Gossypium Purificatum**, that of the National Formulary—**Gossypii Cortex.** *Taraxacum Officinale* of the Dictionary should be **Taraxacum.** The name *Gelsemium* of the Dictionary is correctly given, but the definition is not; namely, "A genus of shrubs; also the root of *G. sempervirens;*" to conform to the official definition this should be: **Gelsemium**—Gelsemium consists of the dried rhizome and roots of *Gelsemium sempervirens.* The examples might be continued, but the foregoing will suffice to point out that confusion obtains when legal standards are not followed; in other words, there should be uniformity in definitions of this kind, thereby adding certainty and definiteness.

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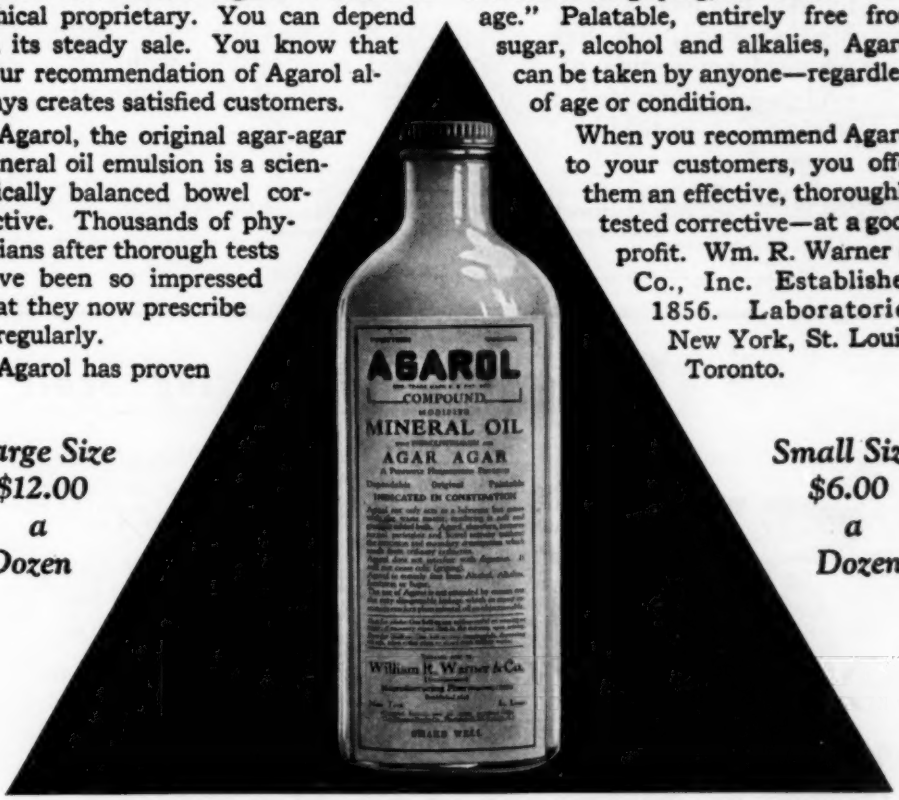


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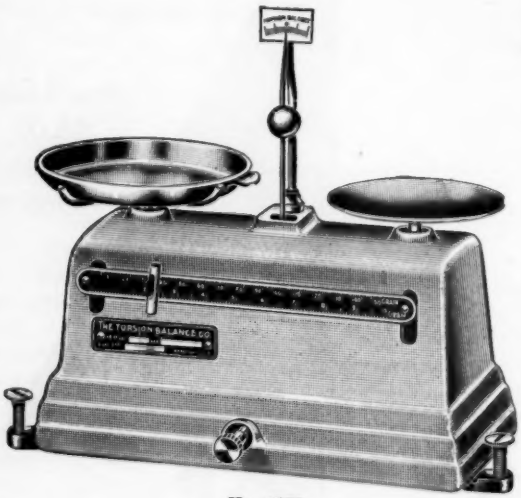


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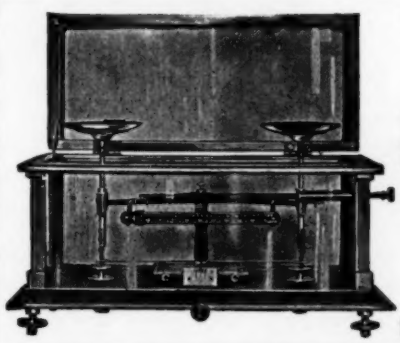

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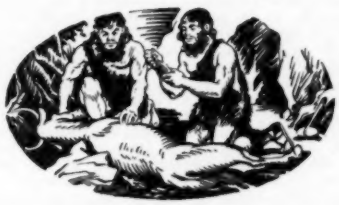
(Continued on page xii)

# Man, the meat-eater, discovered the ductless glands thousands of years ago



EARLY man, but a step removed from the animal, followed the instincts of the lion and tiger, who eat the vitals of their kill. To these organs, which in themselves are rich in vitamins and blood regenerating properties, particularly the liver, are attached some of the ductless glands, which when properly used, contribute to strength and vigor.

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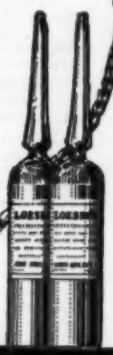

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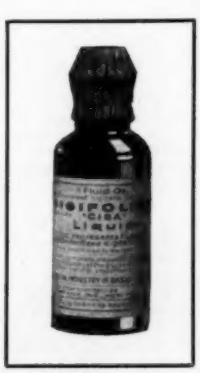

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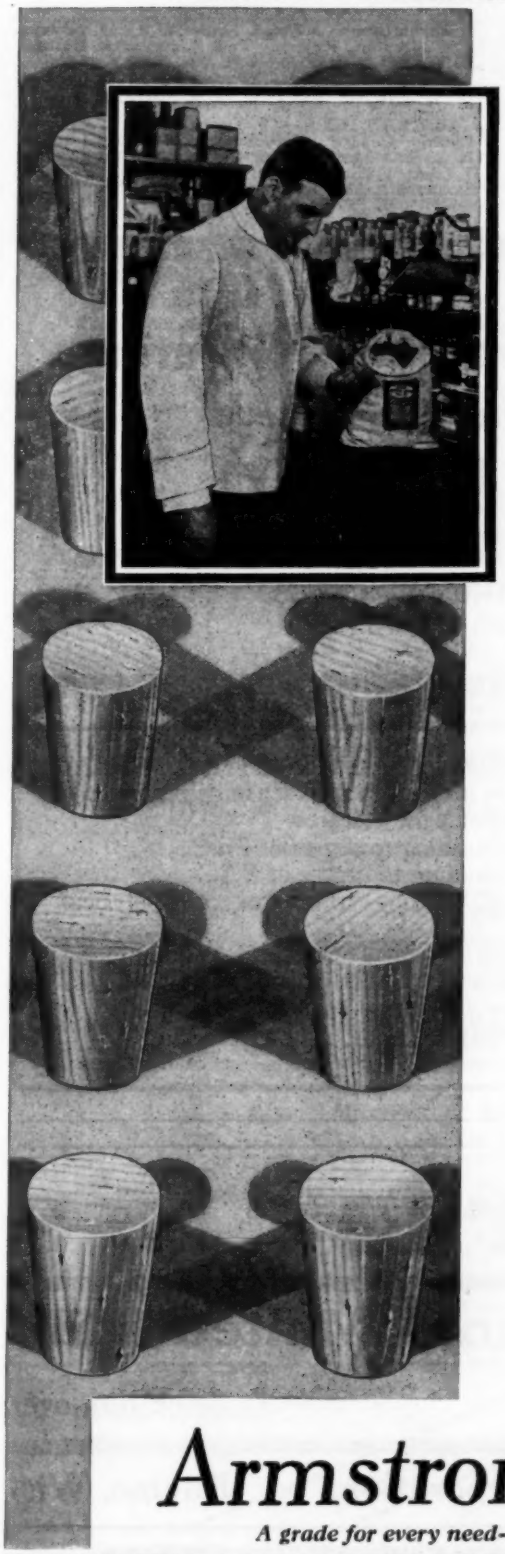

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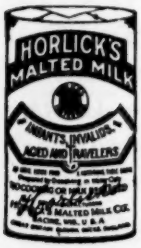


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**National Association of Boards of Pharmacy.**—See Department in this issue. Meets August 26–27 at Rapid City, So. Da.

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